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06 editorial

TONY SARNO

I HONESTLY CAN'T THINK OF A MORE EXCITING TIME TO BE CONSIDERING UPGRADES TO YOUR PC

I've never seen anything like the favourable reaction that Windows 7 is getting from beta testers and basically any man, woman or dog who has downloaded a beta. It's almost as if the Microsoft delivering Windows 7 is from a different planet to the one that was responsible for Vista. Win 7 works beautifully in beta, runs on low-power machines and has a far more refined UI than Vista. In every little detail, Win 7 works. Even the latest wallpapers are amazing, reminiscent of modern art instead of more lame landscapes.

The Release Candidate announced this month will function for a year, and is so good some pundits have suggested it's really the Release To Manufacture version in disguise as Microsoft tries a new marketing strategy, to seed the market with copies that will need to be replaced by the commercial version once the free period expires. If you have a netbook and you're feeling adventurous, we're even suggesting on page 9 that Windows 7 RC 1 will probably give you a better computing experience than a stripped-down version of XP. I realise that not everyone is an enthusiast willing to throw caution to the wind and replace their existing OS with a beta, but you can put RC 1 to good use by using it to revive ageing XP hardware. Stick it on any old non-essential PC with 1GB or even 512MB of RAM and you'll be surprised at how zippy the new OS is and how quickly it boots up. Normally, I would use Ubuntu to inject a new lease of life into old hardware, but RC 1 will do the same. Combine the impending commercial release of Windows 7 with the coming cheaper Core i5 quad-core processors from Intel (page 8), add a 22in widescreen (cover story, page 46) and I honestly can't think of a more exciting time to be considering upgrades to your PC.

Not all the excitement's in PC land, however. What Amazon is doing with cloud computing is extraordinary and in our tutorial on page 94 we give you a sense of how its EC2 cloud web service works. To me, nothing highlights the power and potential of the cloud more than this Amazon service, which lets you create a massively powerful application server at a fraction of the cost of traditional hosting or hardware.

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technotes

THE NEW, THE NEWS & THE QUIRKY VIEWS

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Mini news

GAMING BOOSTER

Game Booster is a marvellous free Windows utility that optimises your PC for gaming. Run it before you fire up a game and it will temporarily shut down unnecessary background processes, Windows services and clean your RAM. From ***www.tinyurl.com/czeo9k***.

MULTIMEDIA STUDIO

Despite its name, Linux Multimedia Studio also comes in a version for Windows and is a truly amazing free open source program that creates a full music studio for your PC, much like the commercial program FL Studio. Its newest version, LMMS 0.4.3, is out now. Get it at ***www.tinyurl.com/a7v5j8***.

UNSPLIT PAGES

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Core i5 is coming

Intel is readying a cheaper, consumer version of the Core i7 CPU.

All the hype about Intel's new Core i7 processors has glossed over the fact that Core i5 (or "Core i7 Lite") is just around the corner. Core i5 is the mainstream, more affordable version of the Core i7 technology. Codenamed Lynnfield, it's the true quad-core replacement for the Core 2 Duo chips. The cheapest Core i7 chip, the entry-level 720, now retails for around $460. The Core i5 chips are expected to retail between $200 and $300, making for cheaper but yet powerful computing with improved handling of high-definition and 3D imagery. Intel is tight lipped about availability but is expected to release Core i5 processors around September/October, possibly to time with a commercial release of Windows 7. To come in 2.66GHZ, 2.8GHZ and 2.93GHz versions, the Core i5 CPUs will have four cores and hyper-threading support, 8MB of L3 cache and will require motherboards based on the new P55 chipset and new sockets LGA 1156 or LGA 1160. The Core i5 processors will have a dual-channel DDR3 memory interface instead of the triple-channel found in Core i7s, as well as DMI interconnection to the P55 chipset instead of QuickPath Interconnect. They are also expected to have a lower QPI multiplier, which means they won't be as overclockable as the Core i7s. Core i5-ready p55 motherboards are now being demonstrated by Gigabyte, ASUS and other major board makers and should be substantially cheaper than X58 motherboards needed by Core i7 processors.

HATCHING
Core i7 may have stolen all the press thunder, but Core I5 is more likely to make an appearance in your next PC...

HOT PRODUCT

World's best (tiny) TV

It's 11 inches, 3mm thick and costs $6,999.

Sony's XEL-1 OLED HDTV is meant to produce the world's best TV picture, so when it finally reached Australia, *APC* had a good look at it. Predictably, the quality of the picture was stunning, with strong colours, sharp detail and refresh times so fast that motion blur was non-existent. And all this coming out of a screen that was only 3mm thick, thinner than an average photo frame!

But since the XEL-1 only comes with an 11in screen it was hard to compare its output to that of an average 40in-plus LCD or plasma TV. And that's the problem with OLED: no-one's yet figured out how to make very large screens with it. OLEDS are thin films of organic molecules that generate colours when voltage is applied, but manufacturing processes struggle to turn them into flawless screens beyond 20 or so inches.

Unless you're willing to shell out $7,000 for a TV not much bigger than a large photo frame, you're going to see the promise of OLED first fulfilled in smaller displays, in smartphones and notebooks. But as makers learn to make them bigger, OLED screens will start making LCDs and plasmas obsolete. Apart from the stunning pictures, they are so thin they belong on walls, like paintings, and consume a fraction of the power of existing TVs because OLED doesn't need backlighting.

WIN 7 ON ITS WAY
The writing's on the wall(paper). Win 7 is on its way and is expected to hit retail in October this year.

WINDOWS 7 SET FOR 2009 LAUNCH

The speed of MS's beta rollout and a blabbermouth Acer exec suggests Windows 7 will hit the streets around October.

After an expectedly well received beta program, Microsoft has rolled out the first Release Candidate (RC) of Windows 7 this month, which means the RTM (Release-to-Manufacture) version is not that far away. This was confirmed by revelations from Acer's UK marketing director Bobby Watkins that Acer's forthcoming Z5600 all-in-one PC would be released on October 23. This date, he said, was when Windows 7 would be officially released! RC1's improvements are extremely simple. Windows now saves changes to your taskbar after 30 seconds, so you're not stuck with your old settings if your PC happens to crash. Stacked items now have a tiny close button so that you can clean up without being forced to use context menus. The 'Invert Selection' function in Explorer, dropped when the underlying code was rewritten for stability and better memory usage, has been reinstated after some users decried its omission. What's more, Explorer's folder hierarchies have been tweaked, with the parent folder always appearing as a single clickable object in the address bar. Perhaps the most exciting development, however, is the new range of 'Windows Features' available from the Control Panel. Here you're given the option to switch off (but not uninstall) various features of Windows, everything from Media Player to – yes, really – IE8. Microsoft has confirmed there will be no simple trading up path between XP and Windows 7, despite plans to offer a cheaper 'upgrade' edition to existing XP owners. Vista owners can upgrade in a more straightforward manner, although the version of Windows 7 on offer will be restricted by the version of Vista: Vista Pro can only be upgraded to Windows 7 Business, Vista Ultimate to Windows 7 Ultimate, etc.

TOP 10 ...GOOGLE TERMINATIONS

Google has got plenty right, but has closed or stopped developing the following services.

1 GOOGLE NOTEBOOK
Development has ceased. Pity, a great web clipping service.

2 GOOGLE PAGE CREATOR
Created quick web sites based on simple page templates.

3 GOOGLE LIVELY
Google's sex-free competitor to Second Life.

4 KNOL
Google's Wikipedia competitor never achieved critical mass.

5 GOOGLE VIDEO
Google's video service before YouTube. Stays, but no uploads.

6 GOOGLE ANSWERS
Like Yahoo! Answers, but you had to pay to ask a question.

7 GOOGLE BROWSER SYNC
Let you sync bookmarks with Firefox, but Foxmarks is better.

8 GOOGLE CATALOG SEARCH
Why would people want to search shopping catalogues?

9 PRINT ADS
A bizarre idea to sell newspaper print ads via a web interface.

10 JAIKU
A micro-messaging service, but Twitter has won that battle.

WINDOWS 7 FREE FOR A YEAR

Is Win 7 RC1 solid enough to be your primary OS? Yep!

Microsoft will let users run the fresh-baked Windows 7 Release Candidate for a full year, through to June 2010. This means the release candidate will still be valid for some six months after the Windows 7 goes on sale, which is tipped for late October or early November 2009. RC1 is a solid build, just as Beta 1 was better than we've experienced in any previous version of Windows. Indeed, for the first time in the history of Windows Microsoft moved straight from Beta 1 to the Release Candidate stage without making the usual stop-overs at Beta 2 and sometimes Beta 3. Grab your copy of Windows 7 RC1 from Microsoft's download site. Provided you can track down the relevant drivers we especially recommend Windows 7 for your netbook: it's got the modern features of Vista but with the nimble light-footed nature of XP. It'll also unlock the full potential of netbooks running Intel's new GN40 graphics chipset, as these rely on 7's inbuilt DirectX 10 and DXVA 2.0 (technologies absent from XP) to deliver the enhanced graphics and hardware video decoding for improved HD video playback.

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HEAD2HEAD

We're all cock-a-hoop about Rudd's national fibre network, but 4G might make it irrelevant by the time it's built.

	NATIONAL BROADBAND NETWORK	4G WIRELESS
Technology	Fibre-optic. Fibres carry information as light signals right to your house or office.	Umbrella term for new-generation wireless technologies under development to replace 3G.
Speed	100Mbit/s promised for NBN (five times faster than fastest ADSL today), but that's conservative. Fibre can theoretically reach speeds of up to 14Tbit/s.	Now up to 21Mbit/s with Telstra's Next G (3G) network and new Sierra wireless modem. 4G aims for 100Mbit/s, but 1Gbit/s and more already achieved in labs.
Mobility	Fibre cable access is restricted to where the router sits.	Depending on the service, can be accessed from multiple geographic locations, and while moving.
Key applications	Will set free any content restricted by bandwidth and turbocharge real-time applications. Will deliver HDTV and revolutionise visual communications.	Although slower than NBN, will do most things fibre-optic can do but also deliver mobile and geo-located applications and services.
Pros	Astonishing speeds, not affected by how many other users on network, low latency (great for online gaming).	Internet access habits are shifting from fixed to mobile the world over and 4G technologies will accommodate that.
Cons	Can't use it for mobile access. Will cost $42 billion, which is enough to provide fast wireless to every Australian many times over.	Speed will never match fibre and is also affected by how many users in the cell. Latency will always be an issue, so not ideal for gaming and real-time apps.
Verdict	Fantastic for virtually unlimited bandwidth access to the net, but by the time it's built, the bulk of users may prefer mobile broadband.	Even now we'd choose fast mobile broadband over faster fixed broadband. Users will value fast and mobile ahead of superfast fixed.

OFFICE 2007 SERVICE PACK 2

Faster Outlook, better charting in Excel and more in Microsoft's Office 2007 SP2.

While the 290MB SP2 is now available from Microsoft's download site it's not due to be pushed out through the Microsoft Update service until at least July. But there looks to be good reasons not to wait. Outlook users look to enjoy the biggest gains from Office 2007 SP2, with Microsoft claiming the upgraded Outlook will be both much faster and more robust. "Outlook 2007 SP2 is 26 per cent faster than its predecessor on a set of common email tasks and is even faster, 35 per cent, with larger mailboxes" according to Jane Liles, Office 2007 group program manager. Searching through Windows Desktop Search 4 is said to be more reliable, while there's been a reduction in the duplication of entries using Outlook 2007's RSS reader. Liles also cites SP2 as delivering "enhanced stability for Outlook (and) calendaring reliability, better charting functionality in Excel and more control over the appearance of SmartArt graphics." SP2 also installs the ability to open and save ODF, PDF and Microsoft's own XPS file formats in Office 2007 as a native feature rather than a separate download. A full list of SP2's improvements available from **tinyurl.com/cqykp7**.

David Flynn

NUMBER CRUNCHING *

13.7 BILLION
Microsoft's revenue for 2008 (* US dollars)

2.98 BILLION
MICROSOFT'S PROFITS FOR 2008

32%
DROP IN MICROSOFT'S PROFITS 2008.

THE (A)PC REVOLUTION
JUN / 1992

Australian Personal Computer
VOICE MAIL
AUSTRALIA'S TOP SELLING COMPUTER MAGAZINE
THE DESKTOP PUBLISHING FOR WINDOWS EXPERIENCE
3-D graphics · Windows 3.1 and OS/2 2.0 · Quattro Pro 4.0

DEC GOES DIRECT

Digital Equipment Corp Australia has brought direct marketing to brand-name personal computers. The $2,960 DECpc 325sx is a 386sx-based system with 2MB of RAM, a 53MB hard drive, Super VGA display, DOS 5.0 and Windows 3.1. It's also available with a massive 105MB hard disk and 8MB of RAM for $3,780.

WINDOWS FOR WORKGROUPS IN BETA

Microsoft has sent its beta testers a new networking version of Windows 3.1 in an effort to erase the line between operating systems and applications. Windows for Workgroups, formerly code-named Spart, will let users share files and printers without buying a full-scale network, according to sources.

ISYS 3.0

Local software development house Odyssey Development has announced version 3.0 of its text-retrieval product, Isys. Since its launch in 1988, the product has become one of the hottest text-retrieval systems on the market.

Linux (+ Subtitles) comp.mov - VLC media player
Media Audio Video Playback Playlist Tools Help
1.00x
00:37/00:56
Linux (+ Subtitles) comp.mov

TUX HITS THE BIG TIME
Linux indulges in some video hijinks in a bid to swipe some attention from the clichéd Mac vs PC TV rivalry.

LINUX HITS BACK

Linux counters Microsoft's and Apple's TV ads with its own TV spots.

When Apple TV ads lambasting Windows led Microsoft to flood the US airwaves with its Seinfeld and then "I'm not cool enough to be a Mac person" ads, Linux was left out in the cold. So the Linux Foundation, the non-profit organisation dedicated to accelerating the growth of Linux, ran a competition to create video ads for Linux to go on the Foundation's web site. The winner is Amitay Tweeto, a 25-year-old graphic designer from Israel, who beat out 90 contest entrants to win the grand prize for his video "What Does It Mean To Be Free?" ad. Although we like it, it's a touch too slick, like something IBM's advertising agency would create, even if the voiceover is in an Israeli accent. And one of the two runners up, "The Origin" comes with a weird sperm meets egg theme, which sees Linux replicating. Our favourite is "Linux Pub" (*www.tinyurl.com/d9slhw*), the French entry in which a giant penguin that reminds us of the Bundaberg Rum Polar bear saves a dying PC and then walks off in triumph with two girls under his arm. That's more like it! See all the contest winners at *www.tinyurl.com/c6uj99*.

Mustknow
Essential Knowledge

DATA OF THE DEAD

It might sound bizarre, but with the proliferation of web-based services such as email and storage it pays to think about whether you want your next of kin to access your data if you should die. Google and Microsoft have stated they will give your family members access to your online data if they provide a death certificate, but this isn't enshrined in law and different providers may have different approaches. If you run a business out of your Google email or documents, others may need to access it in order to keep the business running. Experts recommend that someone you trust (or your executor if you have a will) should be given a list of the addresses and passwords of all your online services that might be of use to others after your death. It's also recommended that you keep any undesirable data you may not want others to see (whether you are dead or alive) in online accounts clearly separated from the rest.

Topsite
URL of the month

SKY DRIVE

While Google's mythical Gdrive attracts the headlines, Microsoft's own online Sky Drive online storage keeps on expanding. It now provides up to 25GB of storage space. While it doesn't appear on your system as another drive and requires files to be uploaded individually, it still gives you a whopping amount of online storage, perfect for archiving.

www.skydrive.live.com

30 MUST-KNOW THINGS ABOUT WINDOWS 7

Mike Williams looks behind the headlines and discovers the secrets, hidden technologies and unadvertised features at the heart of Microsoft's new OS.

Windows 7 has been making headlines for a few months now. If you've read one or two of the stories and reviews dedicated to it, you might think that you know about all that it contains: new touchscreen features, a revamped taskbar with larger thumbnail previews, Internet Explorer 8, easier networking and so on. While that sounds reasonable enough, it's not exactly exciting. It might even have given you the impression that Windows 7 isn't very different from Vista. That assumption, however, would be a mistake.

The reality is that Windows 7 is packed with new developments — it's just that most people aren't talking about them. Would you like to be able to defrag multiple hard drives at the same time, or create a sandboxed PC user account for your kids so that they won't be able to mess up your Windows or program settings any more? What about working with — and even booting from — virtual hard drive (VHD) files, the ability to encrypt USB flash drives to protect the data you're carrying, and tools for calibrating your display to ensure that you're seeing accurate colours and crisp, clear text? Windows 7 has all these features, and a whole lot more.

1 KEEP YOUR PC CLEAN

If you share your PC with less-experienced computer users then you'll know the problems that can arise as they mess up your settings and unknowingly install dodgy software. Windows 7 can help you to avoid these problems. Enable PC Safeguard on the kids' account and they'll be able to log on and play as normal — but when they log off, any settings they've changed are reversed, files they've saved are deleted and your hard drive is returned to its original state.

2 RESTRICT OTHER USERS

If Safeguard isn't enough, try AppLocker. It gives you even more control, restricting users to only the programs you specify. It's able to automatically create rules for your installed programs, and other rules can be added in seconds.

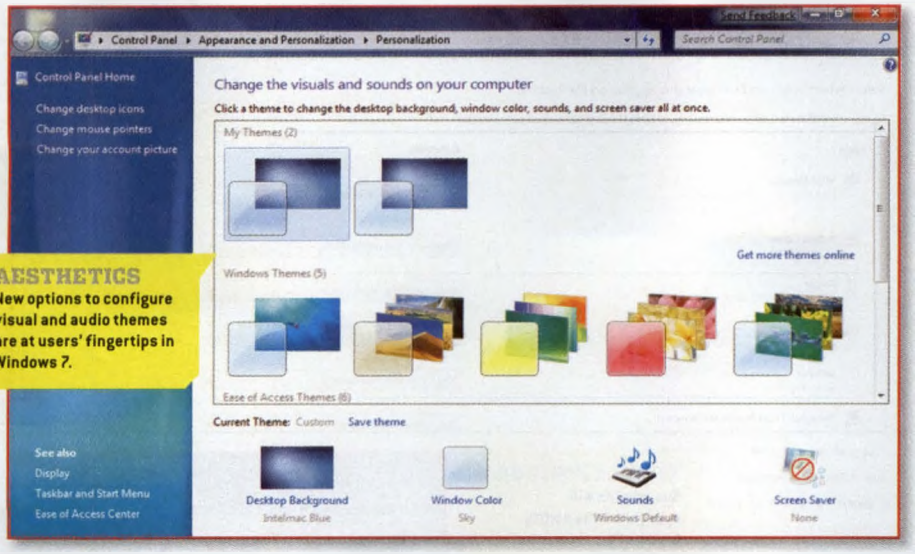
3 ACTION CENTER

Windows 7 replaces the Security Center with the more all-purpose Action Center, which warns you of PC maintenance and back-up issues as well as potential security problems. It's prone to complaining if your security settings don't meet its approval, but at least now there's an effective solution.

If you regularly see messages telling you that you've turned the Windows firewall off, say, then you can choose to disable just those while leaving the more useful alerts active.

4 TONE DOWN UAC

User Account Control irritated many Windows Vista users with its constant warnings that 'Windows needs your permission to continue'. Windows 7 improves the situation by displaying fewer warnings and providing additional UAC



AESTHETICS
New options to configure visual and audio themes are at users' fingertips in Windows 7.

tweaks. Tell the system not to raise warnings if you change Windows settings and you'll be able to use the Control Panel without any prompts. Alerts will only appear if a program tries to perform a similar action.

5 BITLOCKER TO GO

Encryption isn't just for hard drives anymore: the Windows 7 version of BitLocker can protect removable (and easily lost) devices such as USB flash drives, too. Right-click the device in Explorer, select 'Turn on BitLocker' and then enter and confirm a password to protect your data from snoopers.

6 'RUN AS' RETURNS

Right-click a program in Windows XP and you'll see a 'Run as' option that allows you to run the program as a different user. This is very useful if you'd like to run an app that requires different privileges to your current account. The option disappeared in Vista, but Microsoft has relented: hold down Shift while right-clicking a shortcut and you'll see that the 'Run as' option has returned.

7 FIND AND FIX PROBLEMS

Windows has always had plenty of troubleshooting tools, but they've been scattered around many different places. Windows 7 brings order to this situation by placing all of the most important troubleshooters in the new Find and Fix Problems applet, located in the Control Panel. These fix common problems, check for incorrect settings, clean up your PC and more. Developers can create additional troubleshooters, too. You can read more about that at Within Windows (**www.tinyurl.com/bx9ujf**).

8 THE PROBLEM STEPS RECORDER

As a knowledgeable PC user, it's likely that you're called upon to troubleshoot friends' computer problems, which can be tricky if they find it difficult to describe what's going on. Windows 7 has a handy tool to solve this problem.

If an application is misbehaving under Windows 7, all the flummoxed PC user needs to do is launch the Problem Steps Recorder, click 'Record' and work through whatever task they're trying to complete. Every click and keypress that they make will be recorded, packaged up with screen grabs and saved into a single zipped MHTML file, ready for emailing to you. It's a simple tool that's going to save many people hours of tech support.

9 EXTENDED SYSTEM RESTORE FUNCTIONALITY

System Restore has always been a very handy troubleshooting tool, and Windows 7 extends it in a couple of useful ways.

A single click will now tell you exactly which programs and drivers will be restored or deleted if you choose a particular restore point, and there's now an interface that lets you configure the amount of disk space allocated to System Restore. You can also decide not to back up Windows settings.

This means that only files will be backed up, so you'll be able to squeeze more restore points into the available disk space.

10 DISCOVER BOTTLENECKS

If your Windows 7 PC seems sluggish, the new and extended Resource Monitor should help you to sort things out. It's like a more powerful version of Task Manager that not only shows you the processes running on your PC, but also reveals how they're using your CPU, RAM, hard drive and network. A couple of clicks can show you who the biggest resource hogs really are.

11 DIY SYSTEM DISCS

Windows 7 includes a new option to burn a bootable system repair disc. If your PC won't start, pop in the repair disc and it'll do its best to restore normal operations. There's no new technology involved — it's just a CD version of the Start-up Repair tools on your Windows Vista disc — but this functionality will be useful for people who never get a full Windows 7 DVD. It's also safer to carry

FACT FILE

The new Resource Monitor includes a handy 'Analyze Process' option that can give you info on what a program is doing. Could be useful if an app has locked up for no apparent reason.

A LOOK INSIDE WINDOWS 7

A RANGE OF TECHNICAL TWEAKS SHOULD SEE VISTA EATING WINDOWS 7'S DUST.

The latest version of Windows packs a range of tweaks to improve its performance.

The Service Controller now uses triggers to start some services only when required, for instance. Something like the Bluetooth service will only start when you make a Bluetooth connection, improving boot times and reducing the drain on your system resources.

Various kernel and memory management changes mean Windows 7 will require much less RAM than Vista, and so it should run far better on more venerable hardware.

Previously, Windows allowed only one thread at a time to modify key system data structures. These had to be locked before the modification and then unlocked afterwards before any other thread could access them. Windows 7 changes this system and allows multiple threads to access structures at the same time, speeding up busy systems.

Other new features are aimed at developers. User Mode Scheduling lets programmers organise their own threads without the overhead of calling the Windows kernel. Direct2D accelerates 2D graphics, and timer coalescing intelligently aligns timer events to reduce the load on system resources. Initially these changes will have no real effect, but as software begins to incorporate these tricks, you'll see further gains in Windows 7 performance.

one of these around with your laptop rather than risk damaging or losing your original Windows disc.

12 FASTER IE STARTUPS

Some heavyweight Internet Explorer add-ons can take a while to start. IE8 can help you spot the worst offenders. Click 'Tools > Manage Add-ons', peruse the Load Time column and you'll immediately see which extensions are putting a brake on your browsing.

13 SIMULTANEOUS DISK DEFRAGS

Ever wondered why you can't defrag both your hard drives at the same time? There's no reason why not — and now in Windows 7 you can through the command-line defrag tool. Other new switches run the defrag at a higher priority and provide regular progress reports. Enter 'defrag /?' in a command-line window to find out more.

14 MULTITHREADED ROBOCOPIES

The command-line Robocopy tool also sees new optimisations, including an '/MT' switch that can improve performance by carrying out multithreaded copies (you can specify up to 128 threads). Enter 'robocopy /?' at the command line for the full details, though Robocopy newbies should be aware that there are an enormous number of switches to examine.

15 SEARCH CONNECTORS

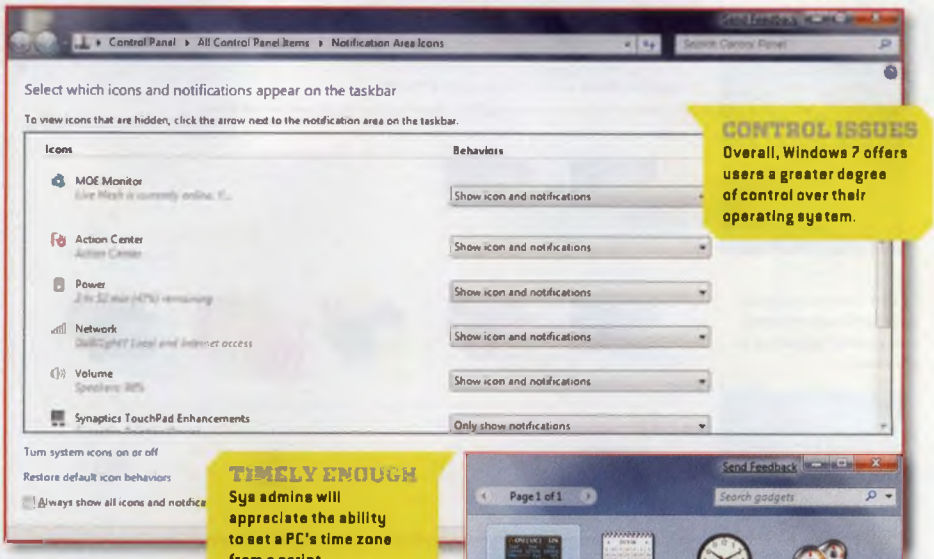
Windows 7 adds support for search connectors. These are small configuration files that extend the Windows Search tool to include online resources. To add Flickr support, for example, visit **www.istartedsomething.com**, search for Flickr, then search to download and open the connector. This will add a Flickr Search option to your Searches folder, and you'll be able to search the site from within Explorer.

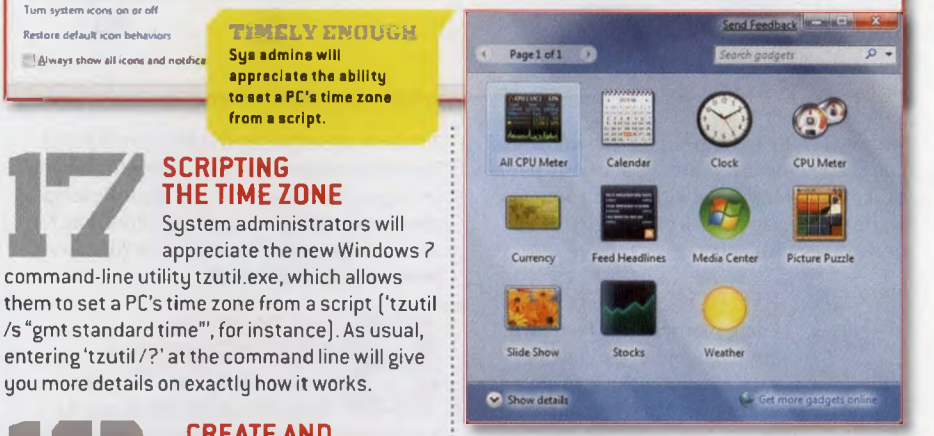
16 SWITCH DESKTOPS BETWEEN DEVICES

Windows 7 introduces a standard way to switch your desktop display between monitors, or from a monitor to a projector. Press Windows+P and select the display that you need.

FACT FILE

Not keen on the new taskbar? Don't worry, a few tweaks in the Taskbar Properties dialog and you can restore normal XP- and Vista-style operations.


Control Panel ▸ All Control Panel Items ▸ Notification Area Icons
Select which icons and notifications appear on the taskbar
To view icons that are hidden, click the arrow next to the notification area on the taskbar.
Icons
Behaviors
MOE Monitor
Show icon and notifications
Action Center
Show icon and notifications
Power
Show icon and notifications
Network
Show icon and notifications
Volume
Show icon and notifications
Synaptics TouchPad Enhancements
Only show notifications
Turn system icons on or off
Restore default icon behaviors
CONTROL ISSUES
Overall, Windows 7 offers users a greater degree of control over their operating system.



17 SCRIPTING THE TIME ZONE

System administrators will appreciate the new Windows 7 command-line utility tzutil.exe, which allows them to set a PC's time zone from a script ('tzutil /s "gmt standard time"', for instance). As usual, entering 'tzutil /?' at the command line will give you more details on exactly how it works.

18 CREATE AND MOUNT VHD FILES

Microsoft's Virtual PC stores the hard drives for its virtual machines in VHD files. Windows 7 finally lets you mount these so that they're freely accessible from the host system (launch 'diskmgmt.msc' and click 'Action > Attach VHD').

You can also create a virtual drive of your own. It'll work exactly like any other drive — you can install programs there, store data, whatever you like — but it's really just a VHD file. Detach it and the drive will disappear, leaving no evidence that it was ever there.

Best of all, in Windows 7 Enterprise and Ultimate you'll even be able to boot from a VHD file, letting you install and try out another operating system without partitioning your hard drive.

19 NEW FEATURES FOR OLD APPLETS

Windows 7 finally sees Paint and WordPad get a welcome facelift. Paint now provides easy access to brushes like 'oil', 'crayon' and 'pencil'. WordPad adds a Zoom feature as well as support for saving documents in Office 2007 '.docx' or OpenDocument '.odt' formats. Both use an Office 2007-style Ribbon interface.

Arguably the best additions appear in the Windows Calculator. Maths wizards will enjoy the powerful new Statistics and Programmer modes, while everyone else will benefit from the new options available in Standard mode. This provides handy unit conversions (length, weight, volume and so on), date calculations (how many days between these two dates?) and templates to help you calculate mortgage rates, vehicle mileage and other tricky things.

20 BURN ISO IMAGES

It's taken Microsoft a very long time, but Windows 7 finally provides a direct way to burn ISO images to CDs or DVDs. Just double-click the ISO image, choose your DVD writer, click 'Burn' and your disc will be created.

21 CALIBRATE YOUR SCREEN CORRECTLY

You've opened up your latest digital photos, but the contrast doesn't look quite right. That's easily tweaked with a graphics editor, but are you sure that the problem is with your image? Could it really be the way that your monitor is set up?

Windows 7 can help resolve these issues with the new Display Colour Calibration Wizard. It's easy to follow and in just a few steps will

have your brightness, contrast and colour settings configured correctly.

22 SHARPER TEXT

Calibrating your monitor properly is a good start, but even then text often isn't as sharp as it could be. That's why Windows 7 also includes the ClearType Tuner. It's a simple wizard that displays several text previews of different ClearType settings. After choosing which example you think looks the best, ClearType is reconfigured with the values you've chosen, making your text look just how you like it.

23 ZOOM IN

The new Windows 7 Magnifier provides a very simple way to take a closer look at any area of the screen. It now follows your Windows focus, so as you press Tab to move around a dialog box, the Magnifier will automatically move to the appropriate area. You can also define a scale factor from two to 16x for an extreme close-up.

24 STICKY NOTES

Windows Vista included the Sticky Notes application found on tablet PCs, a useful way to leave quick notes on your desktop. It needed a stylus, though, so it's good to see Windows 7 update the applet to support the keyboard too. You can create a note with a click, type whatever you want to remember and it'll automatically be saved for future reference.

25 QUICK LAUNCH-STYLE TASKBAR

The most noticeable interface change is the new taskbar, which now works something like a souped-up Quick Launch toolbar. You can pin icons to the taskbar for a quick way to launch applications. The same icons are used to access running instances of the programs.

The taskbar has some interesting new tricks. If you're running one copy of Notepad and want to start another, there's no need to head back to the Start menu. Just hold down Shift, click the program's icon and Windows 7 will launch a new instance for you.

FACT FILE

Try the official Windows 7 engineering blog (*http://blogs.msdn.com/e7*). It's packed with technical details that you won't find anywhere else.

26 CYCLE DIFFERENT WALLPAPERS

Windows 7 includes so many new wallpapers that it's difficult to decide which one you like the best. But who cares? You're now able to select multiple images and have Windows cycle through them, creating an ever-changing desktop.

It's even possible to have a Windows theme that pulls its background from an RSS feed (**www.tinyurl.com/b9ha9w**).

This can be used to display the latest news on your desktop (**www.tinyurl.com/bwvcs6**). This feature isn't fully implemented in the beta, though, and we're not sure if it'll make it to the final release.

27 RIGHT-CLICK EVERYTHING

An easy way to discover Windows 7's hidden depths is to right-click on icons and options.

To begin, right-click an empty part of the desktop and you'll find a menu entry for setting your screen resolution. No need to go browsing through the display settings as you did in previous versions of Windows.

Next, try right-clicking the Explorer icon on the taskbar for speedy access to common system folders, including Documents, Pictures, the Windows folder and more. Alternatively, right-click on the Internet Explorer desktop icon and you'll be presented with a list of the last few sites that you've visited.

If you don't plan on using Internet Explorer and don't want its icon hanging around, right-click it and select 'Unpin this from the taskbar'.

28 CUSTOMISE THE POWER SWITCH

Finally, no more trying to guess what the power switch does — the 'Shut down' button makes it obvious. But if you don't want it to do that, you can easily change the default action to Switch User, Log Off, Lock, Restart or Hibernate.

29 KILL THE SIDEBAR

Just about every report on Windows 7 will tell you that Microsoft has killed off the sidebar, but this isn't true. The sidebar doesn't have a visible interface any more, but it's still launched when your PC starts, and it consumes a few system resources (though less than before) even if you don't use gadgets. You can disable it yourself via msconfig.exe or by manually removing 'sidebar.exe' from the 'HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Run' Registry key.

LET IT ENTERTAIN YOU

WHAT'S NEW FOR WINDOWS 7 GAMES, MUSIC AND VIDEO?

Windows 7 will ship with support for DirectX 11, which offers some performance boost, though this won't matter until games support it. It makes more efficient use of RAM than Vista, so the extra memory will help your gaming performance.

Display colour calibration and better handling of high-DPI displays make Windows 7 a great media hub, and new media-streaming features make it easier to share content all around your house. Intelligent power management should also ensure your laptop battery lasts longer, so mobile users are able to take advantage of that shared data for longer.

Windows 7 Media Center gets some small but welcome new additions. There's a Media Center gadget offering quick desktop access to all your content; an optional 'Recorded TV' link in the Start menu; a 'Now Playing' overlay that tells you more about the currently playing TV; a wall of cover art that displays as you listen to music; and a range of other visual improvements.

30 NEW SHORTCUTS

Windows 7 introduces several useful shortcuts:
[Windows]+[UpArrow]
Maximise the active window;
[Windows]+[DownArrow]
Minimise the active window;
[Windows]+[LeftArrow] or
[Windows]+[RightArrow]
Snap the active window to the left- or right-hand side of the screen respectively;
[Windows]+[G]
Bring gadgets to the front;
[Windows]+[Home]
Minimise or restore everything except the active window;
Hold down **[F5]** still refreshes the desktop, but hold the key down and Windows will automatically arrange your desktop icons.

16 epinions
HAVE YOUR SAY

epinions@acpmagazines.com.au

Come on, have your say! We want to hear what you think. Add to these discussions or email your views (in fewer than 250 words) to epinions@acpmagazines.com.au. All correspondence becomes the property of *APC* and is subject to editing. Letters must include writer's full name, street address, suburb, state and phone number to be considered for print publication and to be in the running for Letter of the Month prizes. Address and phone details will not be published.

THIS ISSUE'S WINNER

Kiran wins a TP-Link Wireless N Router and Adapter bundle worth over $200.

Letter of the month

FLEXIBLE LINUX BOOT

As I was reading the interesting article "Create a bootable WinPE USB key" by James Bannan (*APC* May), I realised the enormous problems we came across all of a sudden with changing of PC technology while deploying the company's image builds.

The major PC vendors have stopped supplying PCs with a floppy drive and a legacy IDE CDROM/DVD, which forces us to use various alternative (and complicated) methods to build the PCs.

But with the advent of BIOS technology to boot from the USB memory key, it brought a new opportunity to quickly configure a bootable USB key with new drivers. Linux has extended this technology further and it can create up to four primary bootable partitions of different operating systems in one USB key. In one instance, I had created three bootable partitions on a 2GB memory stick with the Grub boot menu and DSL Linux on third partition of 60MB and the second partition of 50MB contained Win 98 DOS with menu items to select CD-ROM drivers, Symantec Ghost, Partition Magic, DOS network access and other utilities. The first partition (which was DOS) contained the utility SysLinux for Offline Windows password administration folder and usable storage of nearly 1.9GB on this partition.

Kiran Manandhar
Glenmore Park, NSW

One Linux user is on the defensive over a reviewer's quip about 'geeks'. Believe us, here at APC, 'geek' is not a dirty word. . .

NOT JUST FOR GEEKS

I really have to take exception to your quick review of the Kogan Netbook (*APC* May 2009). The objection is to your throwaway comment at the end of your verdict: "Value winner for geeks."

Can you please tell me what is geekish about plugging in a network cable, switching on the machine and clicking on whatever Web 2.0 icon you need to do your work? Did you actually use the machine, or did you see Linux on the box and simply dismiss it? Do you understand the point of buying a netbook?

I just had a holiday on the Gold Coast and took my Eee PC701 with me. Although I have installed EasyPeasy on the removable SD card and Fedora on a bootable USB drive, whenever I wanted to check emails etc. I used the standard Xandros distro as it booted faster and connected up to whatever free Wi-Fi was available (usually McDonald's). I just used it like a "normal" PC eg. a Windows box.

I have installed gOS on another laptop and demonstrated it to members of my seniors computing club and they were able to use it without any prompting — no geekiness there.

Sure, it won't play WoW without installing and tweaking WINE, but who would buy a netbook as their gaming system, or their primary PC for that matter?

It really irks me that people like yourselves automatically dismiss various Linux distros, simply because they're Linux.

Tony Moloney
Merriwa, WA

DODGY SECURITY

In response to Jenneth Orantia's article "Get online without a wireless router" (*APC* May 2009, page 80), I would like to express my concern and disapproval of the way she suggested the use of WEP encryption on the ad-hoc wireless network being created. It may seem harmless, but for people who don't know, a very long time ago people would have been able to crack WEP in under ten minutes.

Some people may know to add MAC filtering, or use the better WPA encryption, but for newcomers who may just follow the tutorial closely, their security is practically non-existent with the WEP encryption — and this may cause many people quite some harm.

Cracking (and on the other hand, security) technology changes quickly, so please make sure people are informed to follow it, and not get their network owned by a hacker.

Delan Ahmad
Willetton, WA

ISPs DOING THEIR BIT

I would just like to point out some inaccuracies and misconceptions in Steven O'Neil's letter (Epinions,

DON'T DREAM IT'S OVER
In space, no-one can tell you've stopped supporting your game (as the diehard fans will take over!).

GAME LIVES ON

In response to "The Retro Gaming Revolution" (*APC* May 2009, page 66): Freespace 2 (Space Combat Genre) was such a fantastic game that when the creator Volition did not continue it, diehard modders and enthusiasts not only took up the challenge to keep the series going, they also provided a huge 110 free extra missions and campaigns. They have provided some really excellent storylines, greatly improved graphics and music to suit the current battles in space. Check their web site, Hard Light Productions at **www.hard-light.net/** and a list of their campaigns at **www.tinyurl.com/ccwa6j**. "No matter what the cost — don't yield. That's the way it is."

John Williams
Yarravel, NSW

April 2009), where he says that Australian ISPs hobble the development of movie downloads.

I won't go into why internet here is expensive, but many ISPs are getting around this with their own media services, which they provide unmetered to their customers. Just to point out a few — iiNet/Westnet have made the iTunes store unmetered to their customers, and Internode have done the same with the TiVo online media store.

Telstra provide Bigpond Music and Bigpond Movies unmetered to their customers. In many cases this content also remains unshaped when you go over your quota.

All these ISPs provide cheap, easy, legal and best of all unmetered ways to get content from the internet to their customers.

Matt (last name withheld)
Kew, Vic

STEAMED UP

I would like to add to a letter from Steven Ballestrin (*APC* Epinions May 09) about Steam installer Games. Recently F.E.A.R. 2 was released , so I thought I would buy it after being a long-time user of the original game. I was concerned that when I loaded the game, the first thing it had to do was create a Steam account with the CD Key before the game would load. So I went through the hoops and finally got the game installed. I paid nearly $100, for the multiplayer component, but to my disgust, the online multiplayer game was a huge disappointment, nothing like the original, so I wanted to sell, trade or give it away.

I asked the game shop about reselling it second hand, and they suggested contacting Steam and unregistering the game. The reply from Steam was "Steam accounts and CD keys are non transferable." I could not believe it! I am stuck with an expensive game I do not want, cannot sell , or even give away, because it is locked to me. I know a lot of this is to do with stopping game piracy but somehow I feel that I have been robbed here? I doubt if I will ever buy a PC game again; definitely never a Steam Install game.

Ian Braddon
Bundaberg, Qld

CORRECTION NOTICE

APC published an incorrect image of the SMC Barricade Router in the February 2009 Issue. The correct product image is below. *APC* apologises for any confusion caused.

apc

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enduser

FROM THE READERS OF APC

apcenduser@acpmagazines.com.au

Do you work in the IT industry and are forced to deal with inept and clueless end users on a daily basis? If you have an interesting or amusing story, email us at apcenduser@acpmagazines.com.au. All correspondence becomes the property of *APC* and is subject to editing. Letters must include writer's full name, street address, suburb, state and phone number to be considered for print publication and to be in the running for prizes. Address and phone details will not be published.

Smart end user!

An *APC* reader, Adam Bennett, has been in IT for six years and has built a lot of computers. But when he built a dual-core system for a family friend recently, he forgot to plug the power cable to the motherboard. "Because my friend didn't want an OS on it, I just assembled it and handed it to him," Bennett says. A couple of hours later, Bennett got a call from his friend who complained that the PC would not turn on. "I ran him thought a checklist and still nothing, the PC would not start, so in half an hour I turned up at his place and began checking everything." Bennett again forgot about attaching the power plug to the board, so he told his friend he needed to take the machine back home to fix it overnight. Checking and rechecking everything, he was up all night trying to figure out the problem. When his worried girlfriend found him looking the worse for wear the next morning, she asked what the problem was. "She wasn't a technical expert or anything," says Adam, "but she had a look at the PC, plugged the power supply up to the board and turned the machine on. Bang, it started." An incredulous Adam says, "As the saying goes: Not all techs get it right!"

FOLLOW PROCESS PLEASE

A school student from Mt Warrigal in NSW was doing research in the school's computer room with his year 9 commerce class. "All was well until I finished and went to print my work," the student, whom we'll call Tom, says. "After multiple attempts to print to the room's printer, nothing came out. My teacher did the natural thing, asking me to 'try and print again' several times, and turning the printer on and off without success." At this point Tom had noticed that the printer's network cable was not plugged in. He alerted the teacher and asked if he could plug the cable back in. Fearing he might damage the printer, the less than tech-savvy teacher refused him permission, instead sending him up to the network admin's office to get the administrator to try and fix it. "While waiting for the admin to turn up to fix it, I ignored the teacher's instructions and simply plugged the network cable back into the printer. Then as the 10 copies of my assignment are pouring out of the printer, the network admin walks in the door only to find out she had wasted her time." Good work, Tom, but we don't condone you ignoring the teacher's instructions. You could have been severely reprimanded for your act of technical insubordination.

DUMB DOCTOR

Doctors tend to appear quite regularly in End User, and we're not sure if that's because they can afford more technology than the average user or whether their brains are wired for biological machines rather than electronic ones. Paula Bateson, from Baradine, NSW is a volunteer at a Community Technology Centre, where she often helps people with their PC problems. One day, a customer walked in holding a dictaphone and looking all flustered. He told Bateson, "I am a doctor from out of town and need to dictate a letter urgently. Do you have anything that will recharge my dictaphone, as the battery is low?" She agreed to help and looked in the cupboard for a recharging unit that might fit the purpose. "There wasn't an adapter that would fit the unit. However, I turned the dictaphone unit upside down and found a cover. When I opened the cover, out popped two AAA batteries." She turned to the doctor and told him the dictaphone ran on ordinary batteries. "He looked at me and in all seriousness said, 'Why didn't I know this?' Without hesitation I told him, 'Because you are a doctor!' The look on his face was classic. I didn't know whether he wanted to slink away and crawl under a rock or die of embarrassment."

WINNERS GET THIS

Roxio Creator 2009 is Roxio's flagship suite of digital media applications. Creator 2009 introduces a range of pioneering audio features, integration of family-friendly online services, and advanced support for High Definition (HD) video. Creator 2009 also offers a streamlined workflow that enables consumers to complete a broad range of media editing, creation, sharing, and manage projects more efficiently. This takes the guesswork out of evolving technologies and complicated formats and enables users to take full advantage of all of Creator's capabilities. Creator 2009 offers direct links to informative tutorials and how-to articles that provide guidance and inspiration. It is power packed, but easy for all to use. **www.mindscape.com.au**

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Buy safely on eBay

It's not about eBay so much as the process of handing over cash before receiving the goods.

The auction web site eBay is a hugely popular source of bargain deals. The only trouble is that most transactions involve handing over payment before receiving the goods, so there's always an element of risk involved, particularly for buyers. This month's Watchdog is accordingly devoted to buying items safely on eBay.

1 BE CAREFUL

Be aware that there is no specific consumer protection legislation that applies to auction sites. As the NSW Department of Fair Trading explains, consumer protection legislation in Australia generally does not apply to goods purchased at auction, including internet auctions. Your protection comes more generically from various parts of the Trade Practices Act or State Fair Trading legislation that cover the business of selling goods where the seller has made false, misleading or deceptive representations about the goods purchased or has failed to deliver them.

"Consumer protection laws do not apply to purchases where the goods have been auctioned privately. If there is a problem with a private sale, the buyer may need to seek independent legal advice," says the Department of Fair Trading. So in other words, if you buy from an individual on eBay, the old rule of caveat emptor — 'let the buyer beware' — applies.

2 DO YOUR RESEARCH

A key part of caveat emptor is doing your homework before placing a bid. Always thoroughly check out the person or company that's selling an item — it's too late afterwards. You can do this by looking at their seller's details, which will have a history of what they have sold and give ratings for how reliable previous buyers have found them. Don't just look at the ratings, either — browse the comments left by buyers as well.

Power Sellers are the ones to favour with your business.

3 HAVE FAIR EXPECTATIONS

Be realistic when purchasing used items. People have different expectations of quality, so just because the seller says the item is 'like new', it doesn't mean you'll feel the same way. If in doubt, ask the seller for more info. If you're still unhappy with an item's condition on arrival, you can open an 'Item not received or significantly not as described' dispute 10 to 60 days after the day the listing ended.

4 BEWARE OF VAPOURWARE

Ensure the vendor actually has the goods, especially for 'hot' gig tickets, which go on sale up to a year in advance but are only issued shortly before the concert. eBay's rules forbid the sale of goods that can't be dispatched within 30 days, but this is relaxed for concert tickets. However, eBay's dispute procedures will have expired months previously if the promised goods fail to materialise, so unless you know the seller has the physical goods to hand, avoid them like the plague.

5 DON'T BE TOO TRUSTING

Use caution if the price is significantly lower than similar auction items — if it seems too good to be true, it probably is. On high cost items, such as cars, antiques or jewellery, you should insist on payment on collection. Don't transact outside of eBay — you lose buyer protection, seller contact details and feedback scores. Escrow services can be useful, but beware of fake ones — and there are plenty.

6 PAY SECURELY

eBay's plan to force sellers to only use PayPal was scuttled after threatened intervention by the ACCC and complaints by the sellers, but it did point to PayPal as a much safer way to pay for goods. Under no circumstances use wire transfer services, such as Western Union, since these transactions are virtually untraceable and so naturally are favoured by fraudsters. See if your seller has PayPal Buyer Protection (denoted by a PayPal shield next to the item title on the Search and Listings page, or in the Seller Information box on an item page). PayPal Buyer Protection helps you if you don't receive your item or the item is significantly different from its description in the seller's listing. eBay says eligible transactions are covered up to the full purchase price and original postage charges. APC

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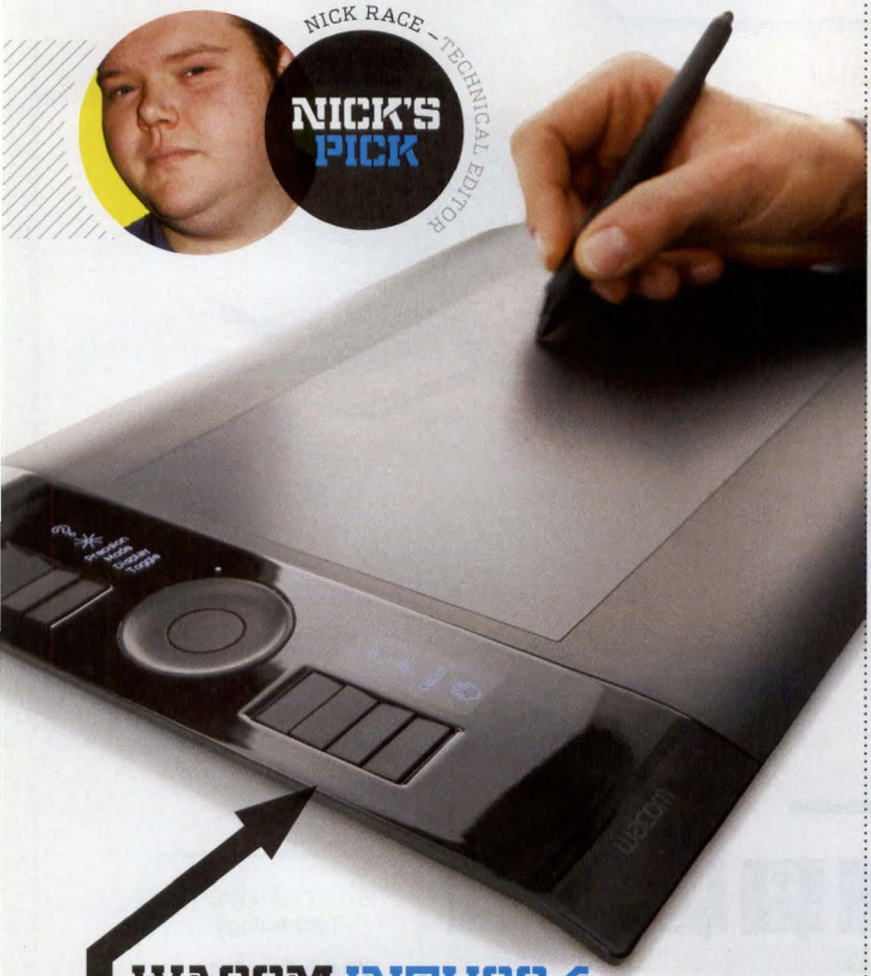

NICK RACE – TECHNICAL EDITOR

NICK'S PICK

WACOM INTUOS 4

Wacom has been churning out top notch tablets since the dawn of the Mouse Age. The Intuos 4 is the latest in a line of impressive drawing tablets, with some very nifty features. With 2,048 pressure levels, interchangeable pens and nibs designed to feel like the real thing, touch sensitive ring and just flip it around for the lefties.

PERFORMANCE ✪✪✪✪

It works a treat. The pressure sensitive levels let you use it as an artist's tool, pens are sensitive and feel good in the hand and it does what it says on the box with a minimum of fuss.

PRICE ✪✪✪

It's quite reasonably priced. The 4 x 6in model is $378, but you're more likely to go bigger to make things easier for yourself, especially if you use it all day.

SETUP ✪✪✪✪

Plug and go couldn't be easier. It can be flipped over for left handed users with ease, and the tablet will even flip the LED display to boot.

LABS ROUND-UP

SCREEN TESTS

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Nick Race looks at the best widescreen LCDs for work rest and play.

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8/10

MSI Wind U115 Hybrid

More get up and go than a Prius.

MSI
www.msicomputer.com.au
$1,099

Beautiful screen; rugged, yet small case; full-sized keys; SSD makes it very responsive.

Slightly expensive given the feature set; doesn't boot up as fast as expected; SSD is tiny.

SPECIAL FEATURES
8GB HDD
10in display
1.6GHz Intel Atom CPU

Clearing a space for this netbook on your cluttered work desk will be easy — it's only 26 x 18cm. Yet it doesn't feel like a tiny netbook, thanks to its 10in screen and full-dimension keys. The case is stiff and sturdy, with none of the flex associated with larger notebooks.

Hitting the power switch, it took 26 seconds to load. Thinking that it could be the multiple programs installed we disabled them via the startup section in the Sys Config Utility, but this failed to make boot times any quicker. It turns out that the SSD in this netbook is only 8GB in size, which is just about big enough to install Windows and one MP3 file. So while apps loaded on the SSD are fast, as soon as it has to access the standard HDD (which is quite often), things slow down.

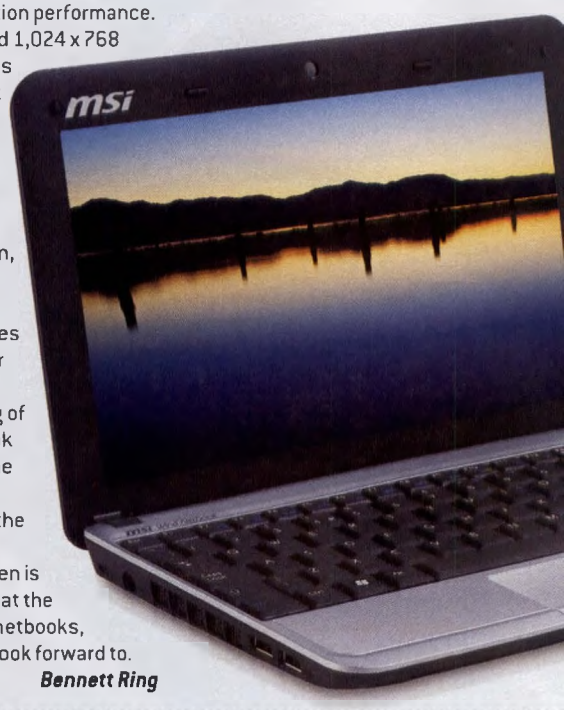
Performance at the desktop is razor sharp. It can't be the 1.6GHz Intel Atom CPU producing such snappy responses. And it's surely not the pathetic 1GB of DDR2 running at a lowly 533MHz. This leaves us to conclude that while the SSD might not help with boot times, it has a major impact on application performance.

It's amazing how good 1,024 x 768 looks when your screen is only 10in. It's very bright with great contrast, something we didn't expect at this price.

There aren't a whole lot of other features though; it's got a webcam, but it lacks a DVD drive, and don't expect any fancy multimedia features like professional audio or accelerated graphics.

Yet, given another gig of memory, this is a netbook we'd be happy to own. The responsiveness within Windows is impressive, the case is the right size and toughness, and the screen is great. If this is a glimpse at the future of SSD-equipped netbooks, then users have a lot to look forward to.

Bennett Ring



8/10

HP Mini 2140

A corporate version of a consumer model.

HP
www.hp.com.au
$799

Stylish metal construction; 92% of full size keyboard; ExpressCard 54 slot.

Only two USB ports; lower screen resolution than its predecessor.

SPECIAL FEATURES
160GB HDD
ExpressCard 54 slot
802.11n WLAN

There isn't a whole lot that distinguishes one netbook from another. The internals are largely the same — a 1.6GHz Intel Atom N270 processor, 1GB of RAM, 10in screen with a 1,024 x 600 pixel resolution and Windows XP Home — so it's mainly just hardware design and the finer details to distinguish between available models.

The HP Mini 2140 has plenty to recommend itself in that regard. It's essentially a corporate version of the Mini 1000, with a stylish magnesium alloy chassis, aluminium lid and metal alloy hinges. Strangely, it's a hundred dollars cheaper than the 1000, but with more features. In addition to the solid metal construction (upping the total weight to 1.19kg), it offers a 160GB 5,400rpm hard drive (twice the size of the 1000), ExpressCard 54 slot, built-in VGA port, and 802.11n WLAN (the 1000 has 802.11b/g).

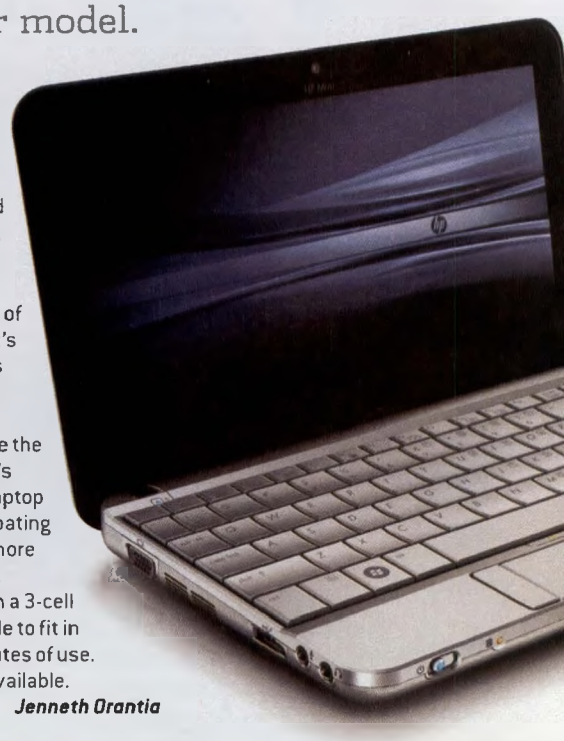
There's no mobile broadband card built-in, so the ExpressCard 54 slot — a rarity on netbooks — comes in handy for connecting an external modem, especially with only two USB ports on board. This is in addition to headphone and microphone jacks, Gigabit Ethernet, SD card reader and VGA webcam.

The flush 10in glass screen has a smaller-than-average resolution of 1,024 x 576 pixels, but it's one of the only netbooks that offers a proper 16:9 aspect ratio for movies.

Touch typists will love the Mini 2140's keyboard: it's 92% of the size of a full laptop keyboard, with a clear coating that makes it 50 times more resistant to visible wear.

The 2140 comes with a 3-cell battery, and we were able to fit in three hours and 16 minutes of use. A 6-cell battery is also available.

Jenneth Orantia



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8/10

Samsung F480

A cute, cheap alternative to the Omnia.

Samsung
www.samsung.com/au
$699

Petite form factor; intuitive touch controls; five-meg camera.

Limited selection of widgets; proprietary connector for headphones.

SPECIAL FEATURES
TouchWiz UI
5MP camera
Video editor

The F480 stands out in a crowd of me-too phones thanks to its distinctive colouring (silver, pink or gold) and unique credit card-shaped form factor. A 2.8in QVGA capacitive touchscreen dominates the front, with a matching clip-on cover that protects the display when it's in your pocket. It's light at just a hair over 100g, and it's reasonably thin at 11.6mm.

The F480 runs Samsung's proprietary TouchWiz software, which is refreshingly easy to use. The homescreen features a range of widgets, and the main menu uses a simple tap-to-launch icon grid, with nifty transitions and animations when you move between screens and applications.

Text entry is equally straightforward. The F480 uses a virtual numeric keypad that takes up most of the screen whenever you need to enter text, with large finger-friendly buttons and the ability to switch between multi-tap and T9 predictive text.

The standard suite of apps typical to a mid-range feature phone are all on board, including a web browser, email client, music player and calendar, but Samsung throws in a few surprises, too. There's a Music Recognition app works similarly to Shazam on the iPhone by telling you the details of a playing track based on a recorded snippet, and the Video Editor lets you compose a movie using videos, stills and audio.

On the multimedia front, the F480 is ably equipped with a five-megapixel auto-focus camera and LED flash, support for a wide range audio and video codecs, an FM radio and a reasonably loud speaker. The 240MB of on-board storage can be supplemented with a microSD card up to 8GB, and while the audio jack uses a proprietary all-in-one connector that's also used for charging and syncing, there's a 3.5mm adapter in the box.

Jenneth Orantia

9/10

Sony Ericsson W705

Music lovers will find lots to like.

Sony Ericsson
www.sonyericsson.com.au
$649

Gorgeous design; Wi-Fi; DLNA certification; intuitive media program.

Limited on-board storage; need adapter to plug headphones in; Shake Control is hard to master.

SPECIAL FEATURES
Shake Control
2.4in QVGA display
Xross Media Bar

Not only is the Sony Ericsson Walkman W705 one of the most stylish to date, with an eye-catching brushed aluminium front, gold accents and chocolate brown back cover, but it's also got a swag of innovative multimedia features that aren't available on dedicated portable media players.

Measuring a petite 95 x 47.5 x 14.3mm and weighing only 98g, the W705 is more compact than most mobiles. The bright 2.4in display has the standard QVGA resolution and support for 262,144 colours, and the slide-out keypad offers well-defined buttons with excellent tactile feedback. Connectivity-wise, the W705 covers all the bases, with quad-band GSM, dual-band 7.2Mbit/s HSDPA, Bluetooth 2.0 + EDR and 802.11b/g WLAN.

The media functionality is what separates the W705: the Media program uses the same highly-intuitive Xross Media Bar interface found on the Sony PS3 and PSP for navigating through photos, music, videos, games and web feeds, and the five-way controller doubles as dedicated media player buttons.

The Shake Control feature is interesting: while holding down the Walkman button on the top, you can switch tracks by flicking the W705 from side to side, turn Shuffle mode on by shaking it, and adjust the volume by moving it up or down. We found it hard to get the gestures exactly right though; it's quicker to just use the hardware buttons.

SensMe and TrackID are both features we've seen in previous Walkman phones: the former automatically creates playlists based on the tempo and mood of tracks in your music library, and the latter displays track information for songs you hear on the radio. New to the W705 is 802.11b/g WLAN, which comes in handy for streaming YouTube clips through the custom front-end and wirelessly streaming content to other DLNA-certified devices. Sharing content over a Wi-Fi network is straightforward.

On the hardware front, the W705 comes with a 4GB Memory Stick Micro M2 card to supplement the 120MB of built-in memory. It doesn't have a proper 3.5mm earphone jack, but there's an adapter in the box for standard headphones.

Jenneth Orantia

7/10

Nokia 5800 XpressMusic

If you've been holding out for a Nokia-style iPhone 3G, the wait isn't over.

Nokia
www.nokia.com.au
$979 (w/ 12-month Comes with Music subscription)

Unlimited music downloads; excellent stereo speakers; bundled 8GB microSD card.

Nokia Music Store is sluggish to navigate; limited software; fiddly text input.

SPECIAL FEATURES
Touchscreen
8GB microSD card
3.2MP camera

The 5800 XpressMusic has many of the same ingredients as the iPhone, like a large touchscreen, multimedia focus, GPS, Wi-Fi and HSDPA, but it's really more of a mid-range music phone that's priced higher to cover the cost of the bundled Comes with Music subscription.

It's compact for a touchscreen phone, measuring 51.7 x 111mm and weighing a scant 109g. But it's no fashion maven, with a black plastic casing, red or blue accents and an unremarkable wave pattern on the back.

As far as screen technology goes, the 5800 offers most of the good stuff: haptic feedback, an accelerometer to automatically switch the display orientation, and a proximity sensor that turns the display off when you're holding it up to your face. But the touchscreen functionality is lacking. Nokia has simply enabled the Series 60 operating system for touch without doing much by way of optimisation.

Nokia's 5800 is iPhone-like and offers great multimedia — but is lacking in other areas.

The end result is a phone that's difficult to use: you have to use the stylus or your fingernail to scroll through screens using skinny scrollbars, and while a few options are available for text input, they're all clumsily implemented. Most annoying is that you can't enter any text directly into a screen — you have to write everything in a separate text entry window that launches whenever you tap on the cursor.

The good news is that it's great for multimedia. The measly 81MB of built-in flash storage notwithstanding (it comes with an 8GB microSD card), the powerful stereo speakers are the best we've heard on a mobile phone, and it comes with a standard 3.5mm audio jack that doubles as a video out. A 3.2-megapixel auto-focus camera with a Carl Zeiss Tessar lens and dual LED flash sits on the back, and the RealPlayer application can play MPEG4-SP, 3GP, H.264 and WMV video formats.

The 5800's secret sauce is the bundled Comes with Music subscription service, providing unlimited access to the four-million-plus tracks in the Nokia Music Store.

Outside of multimedia, the 5800 XpressMusic is fairly basic, and it's the dearth of software that's holding it back. This will change when the Ovi Store — the Nokia equivalent of the iPhone App Store — launches in May, but in the meantime, there isn't much aside from a web browser, email client and Nokia Maps. The web browser can play Flash videos inline, but we could only get it working for YouTube. The email client works well, but there's no software to open PDF or Office attachments. As for battery life, we were able to get two days of medium usage per charge.

Jenneth Orantia

20km Network Link

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www.freenet-antennas.com/bridge

9/10

Nokia E63

Extraordinary battery life and more besides.

Nokia
www.nokia.com.au
$399

Affordable; well-designed QWERTY keyboard; software; outstanding battery life.

No HSDPA or GPS; fixed focus camera.

SPECIAL FEATURES
3G
802.11b/g
2MP camera
3.5mm audio jack

The product lifecycle is usually pretty predictable with consumer electronics. A new model comes out a few months after the old one, with better features and performance at the same or a slightly more expensive pricetag, and the old model gets a price cut. The Nokia E63 goes in the opposite direction. Based on the E71, it complements rather than replaces the higher-end model, with fewer features and lesser build quality for a pricetag that's over $200 cheaper.

Thankfully, the E63 doesn't compromise too much on functionality. There's no HSDPA or GPS, but 802.11b/g WLAN and 3G is still on board. The stylish metal-clad construction has been replaced with a plastic casing and rubberised back, it's slightly thicker, and the 3.2MP auto-focus camera has been swapped for a 2MP fixed focus camera. It's not all about sacrifice, though; the thicker casing means Nokia has been able to fit a full 3.5mm audio jack.

That aside, the E63 makes for a superb messaging phone. The full QWERTY white backlit-keyboard has domed keys with excellent tactile feedback, and navigating through the menus is simple thanks to the comfortable five-way nav-key, soft keys below the screen, four launcher buttons and row of shortcut buttons on the home screen.

The E63 doesn't make any compromises on the software front, so all the great apps found on the E71 are present, including the web browser, messaging email client, Quickoffice 4, internet radio, RealPlayer and Internet Telephony. It also comes with 1GB of free online storage with Ovi.

Topping it off is the E63's excellent battery life. It comes with a large 1500mAh Li-Polymer battery, good for a camel-like 11 hours of talk time and 18 days of standby time.

Jenneth Orantia

6/10

iPAQ Voice Messenger

Lots of specs; less useability.

HP
www.hp.com.au
$649

Compact form factor; all comms bases covered; flexible Windows Mobile operating system.

Poor predictive text software; fiddly controls; sluggish system performance.

SPECIAL FEATURES
Windows Mobile 6.1
7.2Mbit/s HSDPA
528MHz Qualcomm CPU

If you get a strong sense of deja vu looking at the HP iPAQ Voice Messenger, it's because it bears a more than passing resemblance to the BlackBerry Pearl 8130. The same sleek candybar form factor, the same 20-key QWERTY keyboard and a near-identical screen size and control button layout.

In day-to-day use, however, the two devices couldn't be more different. While the BlackBerry Pearl 8130 has an intuitive hardware design and is easy to use, the HP iPAQ Voice Messenger makes even the most basic tasks seem exceptionally complicated.

The software side of the HP iPAQ Voice Messenger is mostly sound. It runs the non-touchscreen Standard Edition of Windows Mobile 6.1, with all the usual smartphone trimmings like Internet Explorer, push synchronisation for Exchange email, Windows Live Messenger and Office Mobile for reading and editing Word, Excel and PowerPoint files. New to 6.1 is the sliding panel interface on the home screen for easy access to appointments, multimedia and profiles, but regardless, the icons and user interface looks flat and dated.

It's the useability element where the HP iPAQ Voice Messenger falls short. The QWERTY keyboard offers good tactile feedback, but the predictive text software needs work. HP has also used an odd combination of control buttons for navigating through the user interface: touch-sensitive soft keys below the screen, a circular four-way touchpad that you stroke vertically or horizontally to scroll through icons and web pages (a D-pad would've been far better).

At least the iPAQ VM doesn't lack for anything in the communications department, with quad-band GSM/GPRS, tri-band UMTS 3G, 7.2Mbit/s HSDPA, 802.11b/g WLAN, A-GPS and Bluetooth 2.0 +EDR. It uses a speedy 528MHz Qualcomm 7201A processor, but there's a noticeable lag when scrolling through the home panels and launching apps.

Jenneth Orantia

8/10

Apple iPod shuffle

Yep, another iPod. This one's the most streamlined yet.

Apple
www.apple.com/au
$129

Tiny size; ability to navigate between playlists; double the capacity of 2G shuffle.

Can't use own headphones; skipping tracks is fiddly.

SPECIAL FEATURES
VoiceOver text to speech
Inline controls
4GB capacity

Apple has managed the impossible with the third-gen iPod shuffle. There's no screen, and this time the playback controls have been eliminated, letting Apple shrink it to the size of a flattened AAA battery (and a mere 10.7g) while doubling the storage capacity from the 2G model to 4GB.

So how does one play music without any playback buttons? Good question. Apple has introduced two features that make this seemingly-impossible task possible. The first is the VoiceOver text-to-speech technology; the second is a set of inline controls on the right-hand earbud cord for adjusting volume and navigating between tracks and playlists.

We'd still rather the old system of buttons, but Apple makes the tradeoff worthwhile by doubling the shuffle's storage capacity to 4GB and letting you navigate between playlists using the VoiceOver feature. Pressing and holding on the multi-function centre button between the volume keys announces the name and artist of the currently playing track, and pressing it for longer announces all of the playlists stored on the shuffle — you can then select a playlist to launch by pressing the centre button again.

The missing playback buttons mean the latest iPod shuffle doesn't have the same intuitive simplicity of every other iPod, but the learning curve is short, and once you've mastered the controls, it's as easy to use as (if slower than) the 2G.

Battery life is rated at 10 hours of playback — two hours shorter than its predecessor. Audio quality is excellent with the bundled headphones, but unfortunately you can't plug your own headphones in if you want to control the tracks or adjust the volume (third party shuffle earphones are in the works).

Jenneth Orantia

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CREST

8/10

ASUS Royal Knight

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ASUS
www.asus.com
$129

Great cooling; all copper design; quiet. ✔

Heavy; no i7 support ✖

SPECIAL FEATURES
Six copper heatpipes
Copper base
Copper fins

While the new i7 CPU from Intel might be hot property, the LGA1366 socket it implements is only catering to a small group of people. The beloved Core 2 series of processors still continue to flood the market and offer a good variety of price and performance. If you want to overclock on the cheap as well, the Core 2 series are a perfect option thanks to such a huge amount of 775 coolers being available.

The recently released Royal Knight cooler expands upon the large line-up of coolers that ASUS offers and caters for most CPU sockets including LGA 775, AMD 754 / 939 / 940 as well as AMD AM2 / AM2+ / socket F. Standing at 138mm tall, 131mm in length and 140mm in width, it's a pretty standard size for a good-quality aftermarket cooler. The 790g weight is surprising, but the cooler is copper so you can see how the weight adds up quickly.

Sitting atop the cooler, ASUS has implemented a 120mm fan that spins at a very peaceful 1,300rpm.

Looking at the features of the cooler, it carries everything that we want to see from a high-quality cooler; six copper heatpipes, copper base and with copper fins. We also have some fins on the side that hang down and help expand the area where the heat can escape, moving it away from the core and keeping your CPU as cool as possible.

With the cooler installed and our Q6600 cranked up to 4GHz we found the maximum temperature our cores got to was 74c at load, while at idle the highest was 37c. While not coolest we've seen our Q6600 run at, considering the price this really is an excellent value cooler that looks great and performs well.

Shane Baxtor

9/10

Enspire AVR550

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SPECIAL FEATURES
Maui audio
Blu-ray player
Athlon X2 5200+ processor

Enspire's new media centre PC is based around an Antec Fusion Remote media centre case and looks like the sort of old valve amp your dad's stereo might have had. It's stylish and whisper-quiet thanks to triple-chamber air channelling, 120mm fans and grommet-padded drive bays. At the front are connections for FireWire, two USB and two audio jacks. A Blu-ray drive lies behind a hidden panel and an LCD screen provides feedback depending on what application is playing. A large dial controls the volume, and for once you'll need it, thanks to the pièce de résistance... the Maui platform.

Maui is defined as having a 780M mobile chipset and D2Audio-based (pre)amp audio card. This PCI card is as powerful as a $1,000 amp on its own. It's not quite powerful enough to fill a very large room but for most living rooms it's a peach and delivers crystal clear audio. A twin HD tuner takes care of recording TV and the EPG is provided by Ice TV.

Other non-standard features include a remote that acts as a mouse and iMON software that helps navigate around MCE and program the front display. There's also a CyberLink Media Deluxe plug-in that lets you watch Blu-ray movies via Media Center.

Everything ticks along nicely with the Athlon X2 5200+ processor, which sits in an MSI MS-7411 motherboard and is flanked by 4GB of PC2-6400 RAM. There's a 640GB hard disk (you can specify more when ordering) plus room for another. Graphics comes from an integrated Radeon 3200 chip, which happily deals with MCE's requirements but won't play any recent games.

This MCE PC worked perfectly during testing and is an ideal partner for a large TV and good speakers. It's the ideal all-in-one living room box and, at this price, we can't fault it.

Nick Ross

7/10 Dell Studio One 19

All-in-one PC with Multi-Touch.

Dell
www.dell.com.au
$1,699 and $1,999

Quite stylish. ✔
Only 19in screen; looks cheap in places. ✖

SPECIAL FEATURES
Touch screen option
Panel form factor

Dell has been selling iMac-like panel PCs abroad for some time now, but the Studio One is the first to land on these shores. We've seen touch-screen panel PCs from HP and ASUS over the past year and both have been impressive: the HP was luxurious and the ASUS was great-value. We got our hands on an early Dell sample and at first glance it seems to lie somewhere in between.

It comes in white or charcoal and is based around a glossy 19in widescreen. The stand provides a solid base and generous tilt angles. The keyboard and mouse of our test unit were cheap, plastic, wired affairs that were comfortable enough to use, although press shots suggest the retail keyboard and mouse will be higher-quality wireless units.

The Studio One follows the usual design formula for panel PCs: most of the components are laptop-based, although the hard disk is full-sized. Specification depends on what you choose when buying via the online configuration: the processor can vary from Celeron to Core 2 Quad; you can choose Blu-ray disc or simple DVD; and even the touch-screen is optional. It's based on Nvidia's MCP7a chipset and only 9200 or 9400 graphics chips are available: both are only suited to playing very old games.

To the left of the speaker bezel is an SD/MMC card slot, two USB ports and two audio jacks. At the back are four USB ports, another audio jack and a 10/100 LAN port. The optical drive is a slot loader on the right and a webcam is built in. Unlike its rivals, there's no TV tuner.

The screen resolution is 1,366 x 768, so it can't play Blu-ray movies natively. It displays a sharp desktop and photos with vibrant colours. Movies look good too with barely any motion blur evident. The speakers get impressively loud but lack bass.

Obvious comparisons will be made with the iMac but it doesn't look nearly as refined or classy: even with the higher-quality peripherals. A 'Multi-touch' bar at the top of the Windows Desktop apes Mac OS X's navigation bar, but with less-glitzy animations. On the touch-screen versions, finger 'gestures' let you flick through pictures and perform basic navigation. These include iPhone-like movements that let you zoom in to photos by moving your thumb and fore-finger apart, which the HP and ASUS models can't do. Software is provided for basic photo editing, finger painting, note making and even music making (with a percussion app).

However, if you want a basic PC that functions and looks a bit like an iMac and takes up about the same room and you can live with a 19in screen, it will suit you. The low-resolution screen limits it for graphics and photo work and it's rather small for movies. ASUS's Eee Top is much smaller, low-powered and cheaper while HP's TouchSmarts are bigger, more stylish and more refined. Leaving out the touch screen, it's pretty much the only choice for a decent panel PC: Sony makes one too but it's extortionately priced.

To be fair to Dell, its Studio range is all about making stylish PCs for undemanding home users, and it's filled a niche with the Studio One.

Nick Ross

Dell's take on the touch screen falls squarely between HP and ASUS's models.

Silverstone SG05

Small, but packs a lot in.

Silverstone
www.silverstonetek.com
$189

✔ Tiny, yet still fits a full sized CPU heatsink and 9in graphics card; 120mm fan; sturdy build quality.

✖ Overly simple compared to the tool-less wind tunnels found elsewhere; no motherboard.

SPECIAL FEATURES
222 x 176 x 276mm
300W PSU
120mm fan

It used to be hard to find a PC smaller than a bar fridge, but then along came the Small Form Factor PC, delivering all the gaming goodness of a full tower in the desk-friendly dimensions of a shoebox. The first thing we noticed about Silverstone's SG05 is how simple it is, although it ships sans motherboard. Any Mini-DTX or Mini-ITX motherboard will do the job, so expect to pay another hundred dollars or so.

If you choose to turn the SG05 into a gaming machine, you'll be happy to note that it can fit a full 9in single slot graphics card, as well as a stock AMD or Intel heatsink. Admittedly there isn't a lot of room left over, but for a case that is only 222 x 176 x 276mm, managing to fit these two components is quite an achievement.

The sturdy case has the usual microphone and headphone jacks, along with a couple of USB ports. Inside is a very simple design: the drive bay unscrews and lifts out, while the motherboard mount is fixed. A tiny 300W PSU supplied the juice. Everything is held in place with regular Philips head screws.

The SG05 relies upon a brisk 120mm fan to suck cool air in at the front of the case, which is vented via extensive vents at the rear. Given that the case is so small, the optional SilverStone TOB02 Blu-ray drive is a godsend. Bear in mind it'll cost you another $229 to include.

All up, the SG05 is a decent effort but doesn't have the great cooling or slick designs of Shuttle's best. Throw in the lack of a motherboard and it's also not the cheapest SFF case around.

Bennett Ring

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✖ Price; takes a bit of getting used to.

SPECIAL FEATURES
Multiple nibs
2,048 pressure levels

At the forefront of tablet development has been Wacom; in a world not known for longevity, my first tablet back in 1980-something was a Wacom, and today I am testing its latest and greatest, the Intuos 4.

There are four models in the range in sizes that range from 4 x 6in active area to a huge 12 x 19in. On the left hand side is a panel containing two banks of four user-definable 'Express Keys' separated by a touch ring that is also user-definable in four states.

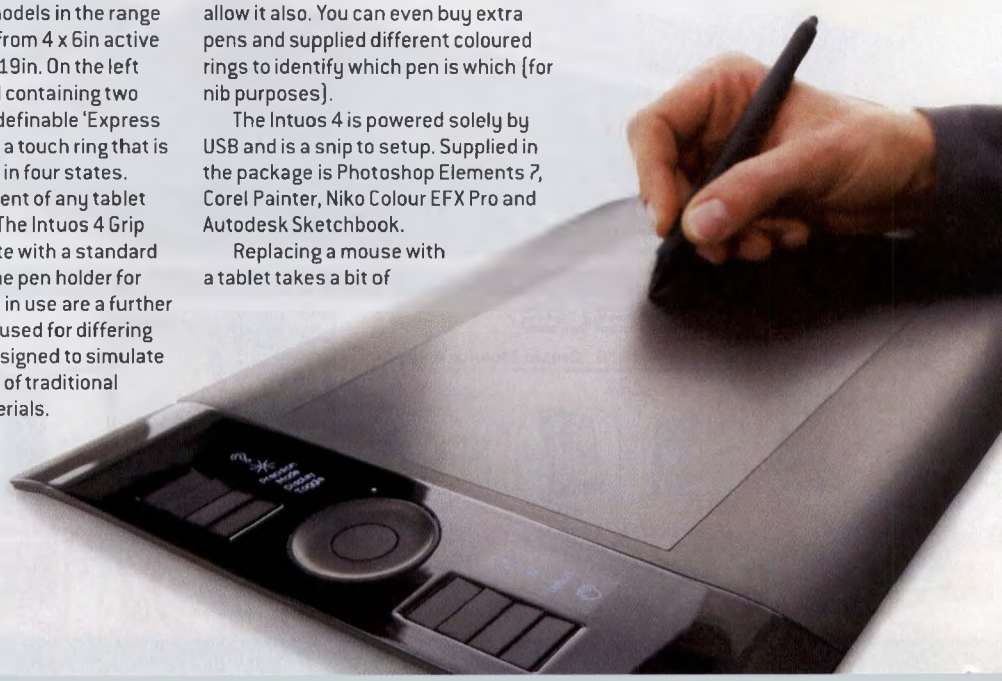
A major component of any tablet system is the pen. The Intuos 4 Grip Pen comes complete with a standard nib, and built into the pen holder for when the pen is not in use are a further ten nibs. These are used for differing strokes, and felt designed to simulate the variety and feel of traditional art and design materials.

This is because, unlike many pen style devices doubling as a mouse, the Grip Pen in concert with the tablet allows drawing with up to 2,048 pressure levels. This makes the Intuos 4 ideal for graphic designers, architects and so on, and it is brilliant to use with newer video editing packages that allow it also. You can even buy extra pens and supplied different coloured rings to identify which pen is which (for nib purposes).

The Intuos 4 is powered solely by USB and is a snip to setup. Supplied in the package is Photoshop Elements 7, Corel Painter, Niko Colour EFX Pro and Autodesk Sketchbook.

Replacing a mouse with a tablet takes a bit of getting used to, but after a 'training' period, it becomes much more intuitive and certainly more accurate. I'll never go back to a mouse-only situation.

David Hague



8/10

Gainward GTX 275

A good performer for the cash.

Gainward
www.gainward.com
$499

Faster than HD 4890; nice bundle; good value.

More expensive then HD 4890; more model confusion.

SPECIAL FEATURES
240 stream processors
80/80 Texture Address/Filters
55nm-based core

Expanding on its already huge range of graphics cards, NVIDIA has released the GTX 275. It's designed to sit between the GTX 260 and GTX 285, and it competes with ATI's HD 4890.

We don't see anything new here; the GTX 275 is what could best be described as a GTX 285 and GTX 260 morphed together with the new model utilising features from both. It offers 240 stream processors, 80/80 Texture Address/Filters and a 55nm-based core, just like the GTX 285. Its GTX 260 similarities are 28 ROPs, 448-bit memory bus and 896MB of GDDR3. The card is rounded off with a 633MHz clock, 1,404MHz shader clock and a 2,268MHz DDR memory clock.

It carries significantly less stream processors when compared to the HD 4890's 800. Where we do see the bigger jump for the GTX 275 is in the memory bus, which is significantly higher than the HD 4890, along with only 16 ROPs being seen on the competing model. In real-life testing, for the most part we see the GTX 275 outperform the HD 4890, especially at resolutions higher than 1,920 x 1,200.

While both cards are being marketed overseas at the same price point, when it comes down to it we're finding that the GTX 275 is $20 - $40 more expensive then its ATI counterpart. The extra price offers some extra frames per second, which ultimately finds the card offering the same value for money as the HD 4890. The decision to buy the GTX 275 will really come down to if you're happy to spend a bit more money for a bit more performance.

Shane Baxtor

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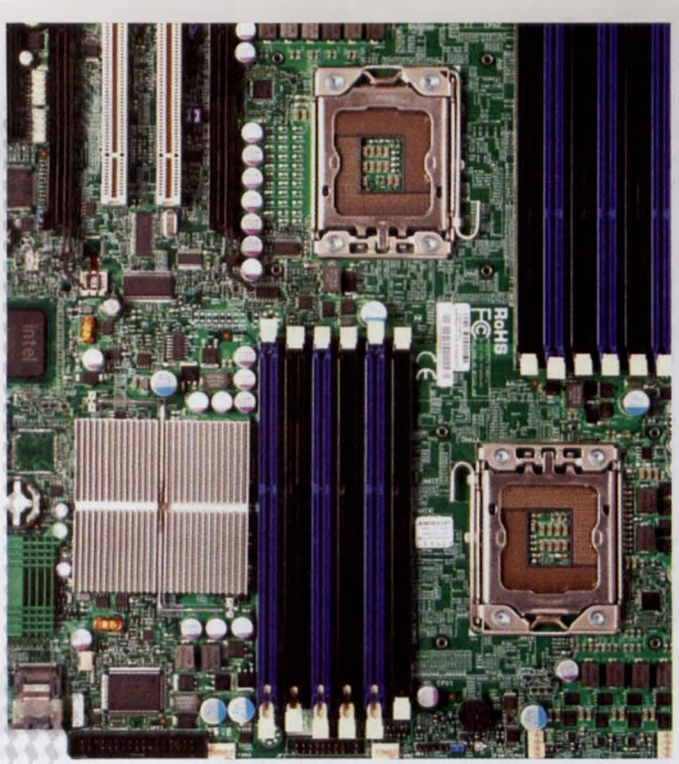
FIRST LOOK!

INTEL XEON 5500 SERIES

Xeon goes Nehalem. **Nick Race** takes a first look at Intel's next server platform.

Intel's Core i7 series of processors for the desktop changed the way that its chips did business. It moved away from having an off-chip memory controller and a Front Side Bus in favour of direct connections between the CPU and memory, re-engineering the way the chip talked with the rest of the system. In a desktop, it shows some non-inconsiderable performance increases, especially in software that is heavy on memory bandwidth. In a server though, that's a much bigger part of the game; especially when we throw virtualisation in to the mix. So what's on the table? Intel has released a range of nine new Xeon processors, dubbed the 5500 series based on the Nehalem architecture. These are the E series processors starting with the E5504 running at 2GHz and 4MB L3 cache and an 80W TDP, up to the X series processors with a 95W TDP culminating at the X5570, a 2.93GHz part with 8MB L3 cache. There's also an odd-one-out, a single W series workstation part with a 130W TDP running at 3.2GHz.



CORE DESIGN

As with Core i7 processors, the Xeon 5500 series of processors use the Nehalem core designed in Intel's Israel development labs. The Nehalem design removes the Front Side Bus from the CPU equation, replacing with a direct connect interface to the system dubbed Quick Path Interconnect (QPI). QPI is responsible for all data traffic from the CPU core to the chipset as well as socket to socket in the case of multiple CPUs.

Nehalem itself packs 731 million transistors, and improvements in the Xeon 5500 series include deeper buffers, better branch prediction and additional caching hierarchy. The execution unit is capable of performing 6 operations per cycle, though that's an ideal case involving 3 memory operations and 3 computation ops. An increase of 33% in the instruction window allows for increased instruction parallelism, giving the instruction pipeline more opportunities to see efficient usage. Also making a comeback from older designs is the inclusion of HyperThreading technology, which increases parallelism even further. All this is designed to increase performance for virtualisation. With the processor capable of executing more instructions simultaneously, the performance of VMs running on the chip gets a big boost.

THE UNCORE

We're exposed to a new term here, the Uncore, which translated from Intel parlance is the hardware inside the chip that is separate from the core. In this case, it specifically means the level 3 cache, the power and clock speeds, the integrated memory controller and the QPIs. What makes the Uncore just as important as the CPU's core is the model differentiation. Adjusting the Uncore parts, for example increasing or decreasing the clock

THE UNCORE: THE HARDWARE INSIDE THE CHIP THAT IS SEPARATE FROM THE CORE

speeds and L3 cache amounts, gives us a different processor model. A 2.66GHz model vs a 2.8GHz for example, or an E5520 with 8MB of L3 cache and a 5.86GT/s QPI speed vs an E5506 with 4MB of L3 and a 4.8GT/s QPI speed.

THE PLATFORM

A CPU doesn't operate in isolation. To back up the Xeon 5500 series of processors we get the none-too-surprisingly named 5500 chipsets, codenamed Tylersburg. The first 5500 series chipset off the ranks is the 5520 model, previously known as the Tylersburg-36D. We'll continue to call it Tylersburg in this article to save confusion.

The Tylersburg chipset packs just as many changes from the last generation as the CPU. The main differences include a lack of memory controller (which is in the CPU now) and integration of QPIs. The platform offers support for 6 channels of DDR3 memory at 800/1066/1333 speeds in RDIMM or UDIMM configs with up to 3 dual-rank or 2 quad-rank DIMMS per channel. Using 8GB DIMMS, you're capable of squeezing up to 144GB of memory into the 2 CPU platform, although that's only supported running at DDR3-800.

Tylersburg supports both the ICH9 and ICH10 southbridges, so expect to see different configurations from vendors. There's also 36 Gen2 PCIE lanes and 6 Gen 1 lanes, so different configurations based on usage model are definitely on the card.

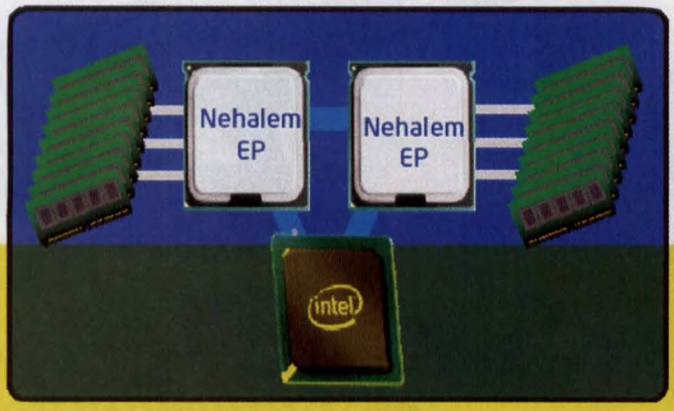
The great news about the Tylersburg chipset is that it's packing extra QPI connections of its own. Future platforms from Intel sporting two chipsets, ideal when you need more PCI express lanes (can anyone say 4x 16x graphics arrays?) are just down the road.

FUNCTIONAL DIFFERENCES

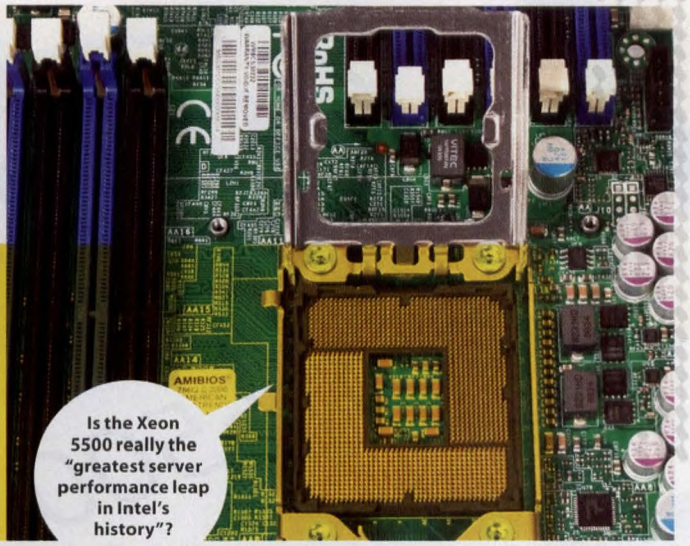
With a basic plan of the system under our belts, there's more changes and technologies put in place to continue with the performance increases Intel intends. First off the rank is "Turbo mode". It's not a big button like on the front of your 386, but a constantly active evaluation of each core's load that allows some minor speed bumps in the right circumstances.

In a four-core processor, when a physical core isn't doing much of anything (let's say, with some not so parallelised code), 55x0 processors can put that idle core in to a sleep state. The very low-end 550x chips don't get this technology at all. That's all well and good. What happens next is that the other active cores in the processor are then overclocked slightly, up to two speed "bins" of 133MHz increments, increasing their performance. It's as close to a win-win situation as we can get; increased in parallelised performance on one hand, using Hyper Threading and core changes, but if we're not running parallelised code, then we get a speed boost using the underutilised core's power and thermal allowance.

Power consumption was also a big concern with the 5500 platform architects. Lower power consumption across the board, plus increasing performance is a Herculean task, but 5500 has taken a big step. As mentioned previously, the Xeon 5500s are capable of now putting unused cores into a C6 deep power down state. Older processors had an all-or-nothing approach to this, turning the power off to the CPU was as



New basic system design: QPI links between the CPUs and chipset improve internal throughput.



Is the Xeon 5500 really the "greatest server performance leap in Intel's history"?

granular as it got, but Nehalem offers a power control unit that can shut down cores separately and bring them back gracefully when required. The speed at which the chip can change the power states has also been increased five-fold. This adds up to a 50% lower power consumption when idle.

VIRTUAL PERFORMANCE

Virtualisation had another big target painted on it for this server generation. Intel has developed some technologies to make life much easier when running virtualised servers. Firstly is Intel VT-c, or Virtualisation Technology for Connectivity. In a nutshell it "provides hardware assisted I/O that accelerates network performance and simplifies VM migration". Second is VT-d, or Virtualisation Technology for Directed I/O, and is perhaps the point to notice. VT-d allows the platform to assign I/O devices to virtual machines directly, doing away with the overhead of passing the data through the VM management software. Essentially, VMs can have access to their own I/O hardware at full speed.

PERFORMANCE

Kirk Skaugen, VP of the Digital Enterprise Group and General Manager of the Server Platforms Group at Intel, came right out to say this: "[The Xeon 5500 Series] are the greatest server performance leap in Intel's history." That's a long history, so let's see if he's right.

Our Intel-provided test platform consisted of a dual Xeon X5570 configuration in an ASUS RS700-E6/RS4 server with 24GB of ECC Registered DDR3-1333 memory.

We used a small selection of benchmarks, including LINPACK, CINEBENCH R10, POV-Ray, Stream and a suite of benchmark applications developed at the CS Department of Princeton University dubbed Parsec. Parsec includes benchmarks including x264 encoding, plus some old faithfuls like BlackScholes.

The biggest jumps were seen with bandwidth-intensive benchmarks — typically, AMD Opterons were king in the past. Intel's new Front Side Bus Free design has picked up the slack, with some of our initial tests outperforming AMD in its traditional stronghold by 150%. Performance over the last generation 5400 series Xeons has jumped from 5-120% over a range of benchmarks. Check **apcmag.com** for more results.

BRINGING IT ALL TOGETHER

From all these separate parts and technologies we start building up a workable platform, and obtain some expectations on how it all comes together. With the Xeon 5500 Series processors, tuned for virtualisation, power efficiency and scalability and the 5500 Series chipsets built for scalability and reliability, we're starting to see just what it's capable of doing.

Nick Race

Intel › **www.intel.com/server**

CPU MODEL BREAKDOWN

CPU MODEL	SPEED	QPI	L3 CACHE	DDR3 CLOCK	TDP	PHYSICAL CORES	THREADS	TURBO-BOOST ENABLED
E5502	1.86GHz	4.8GT/s	4MB	800MHz	80W	2	2	No
E5504	2.00GHz	4.8GT/s	4MB	800MHz	80W	4	4	No
E5506	2.13GHz	4.8GT/s	4MB	800MHz	80W	4	4	No
L5506	2.13GHz	4.8GT/s	4MB	800MHz	60W	4	4	No
E5520	2.26GHz	5.86GT/s	8MB	1,066MHz	80W	4	8	Yes
L5520	2.26GHz	5.86GT/s	8MB	1,066MHz	60W	4	8	Yes
E5530	2.40GHz	5.86GT/s	8MB	1,066MHz	80W	4	8	Yes
E5540	2.53GHz	5.86GT/s	8MB	1,066MHz	80W	4	8	Yes
X5550	2.66GHz	6.4GT/s	8MB	1,333MHz	95W	4	8	Yes
X5560	2.80GHz	6.4GT/s	8MB	1,333MHz	95W	4	8	Yes
X5570	2.93GHz	6.4GT/s	8MB	1,333MHz	95W	4	8	Yes
W5580	3.20GHz	6.4GT/s	8MB	1,333MHz	130W	4	8	Yes

9/10

WD Caviar Green 2TB

Fix your storage worries with a 2TB drive.

Western Digital
www.wdc.com
$469

Extreme capacity; lower power consumption. ✔

Not the fastest drive. ✖

APC MAGAZINE apc EDITOR'S CHOICE

You can now buy a 2TB hard drive for your PC. Read our lips. Two terabytes. That's 2,000 gigabytes. In practical terms it means you can store hundreds of uncompressed movie files on your PC without having to archive them onto long term storage. Or thousands of games and patches. Or hundreds of thousands of songs or photos. The WD Caviar Green 2TB (WD20EADS) is the highest-capacity drive available on the market and follows the release of Seagate's 1.5TB drive.

WD has employed several new techniques to squeeze 2TB into the 3.5in drive. One was to secure the motor shaft (or spindle) at both ends to reduce system-induced vibration and stabilise platters for accurate tracking of much smaller tracks during read and write operation. Another was to ensure the recording head never touches the disk media. Normally, when drives slow down, the head is designed to settle in a "landing zone" on the platter, which over time can cause it to wear, while vibration can sometimes force a head to brush against the spinning platter.

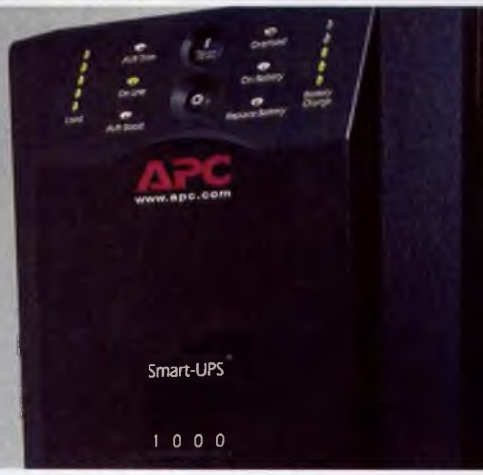
As part of the Green Caviar line, it aims for a balance of power consumption and performance, so the 7,200rpms won't set your PC on fire with blinding speed. In our tests using the HD Tach benchmark, the WD20EADS returned an average read speed of 80.7MB/s, which is slower than the Seagate Barracuda 1.5TB's 104.2MB/s, but to a user who wants heaps of storage, it will make little difference.

Tony Sarno

READERS CHOICE 2008

BLACKOUT!

30 MILLION APC CUSTOMERS STILL HAVE POWER. DO YOU?



Think of all that you rely on your computer for: personal and business fi les, financial information, broadband access, videos, photos, music, and more. Increasingly, computers are the hub for managing our lives. And more people rely on APC to protect their hardware and data than any other uninterruptible power supply (UPS) brand.

Why is APC the world's best selling power protection?

For 20 years, we have pioneered power protection technology. Our Legendary Reliability® enables you to save your data, protect your hardware, and prevent downtime.

It also guards against a power grid that is growing less reliable every day.

Today, energy consumption is increasing while investment in utilities is at an all-time low. It's a "perfect storm" for computer users, one that makes APC protection even more essential.

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APC Solutions for Every Level of Protection:

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Best value battery backup and surge protection for home computers.
8 outlets, DSL protection, 44 minutes of runtime**

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High-performance network power protection with best-in-class manageability for servers.

Register to WIN a Back-UPS® ES700 - value $259.99 and download a FREE white paper "The seven types of power problems"

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*Recommended Retail Price. **Runtimes may vary depending on load

APC
Legendary Reliability®

6/10

Linksys Media Hub NMH405

Media-savvy, but curiously security-free.

Cisco
www.linksysbycisco.com
$700

Makes it easy to share media. ✔
Can't set user access to shares. ✖

SPECIAL FEATURES
Media retrieval
Two SATA bays
1.8in OLED screen

The Linksys Media Hub is forging a path as a new type of NAS. Rather than acting as a pure storage appliance, the NMH405 can scour your network, find the multimedia files scattered across different systems and pull them together. With a slick, browser-based application, you can then get a complete view of all the music, movies and photos distributed across your LAN and play them back from any UPnP enabled device.

The NMH405 has two SATA drive bays, a 1.8in OLED screen, memory card slots for CF/MD/MS/SD/XD/MMC and Gigabit Ethernet. Out of the box, it comes with a single 500GB hard drive. However, that can be very easily expanded with a second disk.

Copying files over Gigabit Ethernet showed that the device offers solid performance. We copied a test package of 480MB of files to the unit in 37 seconds. Copying back that package of data took 25 seconds.

With photos, we took a SD card and plugged it into the slot at the front the unit. Using the four-way controller and OLED screen, we were able to easily copy the contents of the card. The same process worked with a USB stick.

As well as all the media sharing, the Media Hub makes it dead simple to share any other files. However, there was no way to create user accounts so that access to shared folders can be assigned to specific people.

There are a number of things that the Linksys NMH405 does really well. It makes the task of finding and playing media easy and offers decent performance. However, this is tempered by the inability to assign permissions to folders. This, in our view, makes it a decent NAS for the home but might limit it in the office.

Anthony Caruana

9/10

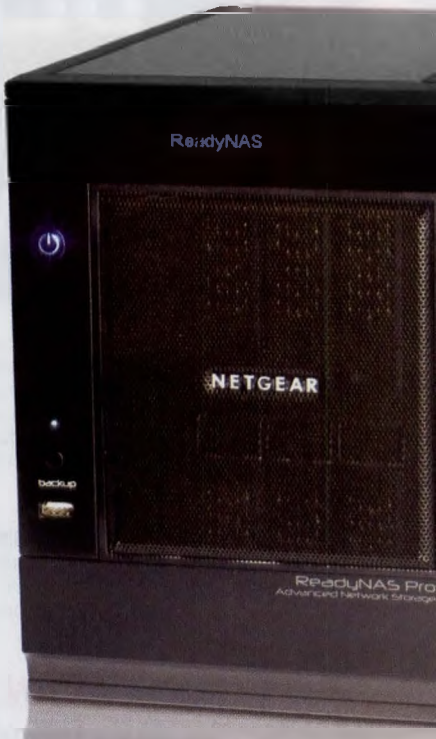
Netgear ReadyNAS Pro

Big capacity and big performance.

Netgear
www.netgear.com.au
$4,299

Performance; quiet. ✔
Minor setup glitch. ✖

SPECIAL FEATURES
Six-drive capacity
RAIDar utility
Upgradeable to 4GB RAM



The ReadyNAS Pro has room for up to six hard drives and should be on your shopping shortlist if you're looking for some serious storage.

Installation was simple. Netgear's NAS devices ship with its RAIDar utility. Installed from the accompanying CD, RAIDar interrogates your LAN and searches for ReadyNAS units. There are two Ethernet connections on the ReadyNAS Pro, so you can have some failover connectivity. We did have one problem with RAIDar that eventually resolved itself: the "Setup" button in RAIDar directed us to a specific part of the setup utility at times.

Drives can be configured in a variety of RAID configurations. Our test unit came with three 1TB drives configured in a RAID5 array. The unit is driven by a dual-core processor with 1GB of DDR2 RAM, upgradeable to 4GB.

We were impressed by the ReadyNAS Pro's performance. We used a 500MB test package of files of varying sizes and, sending the files to the ReadyNAS, we found that it was one of the fastest NASs we've tested. Writing the files took just 18 seconds. In addition to the local file access over a LAN, the ReadyNAS Pro allows you to set access to specific folders and access them by FTP or Secure FTP. Coupled with a dynamic DNS service, this makes the ReadyNAS Pro an easy way to share files over the internet.

Many large NAS boxes run very loud as they require several fans to keep the drives cool. The ReadyNAS Pro fans did a good job and were quiet. While we wouldn't keep it on a workstation desk it could happily live in an office corner.

The Netgear ReadyNAS Pro delivers excellent performance and is easy to set up and use. It delivers great flexibility with different RAID and accessibility options. Those looking for a large-capacity system with brilliant performance will not be disappointed.

Anthony Caruana

APC MAGAZINE apc EDITOR'S CHOICE

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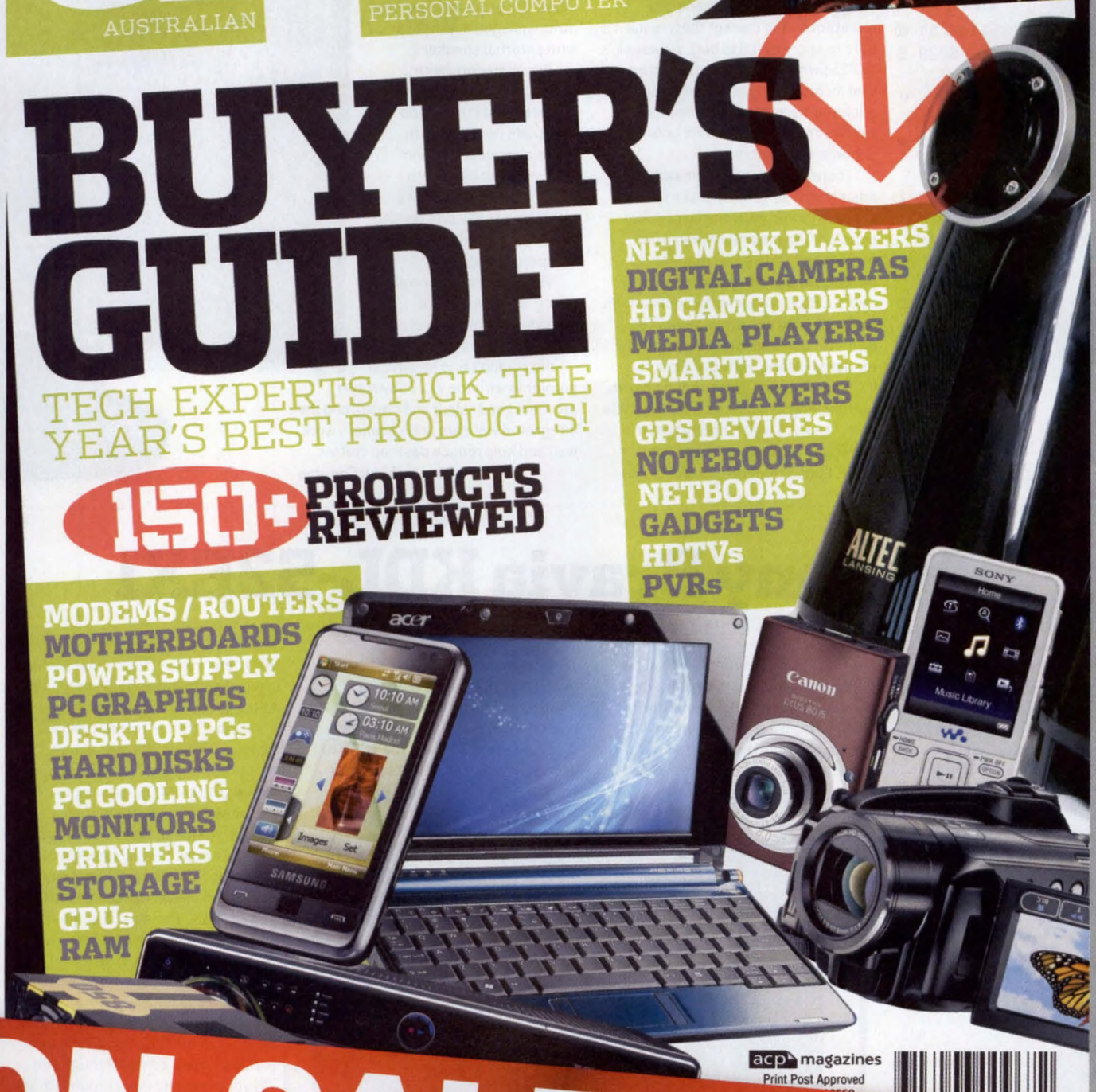

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ON SALE NOW!

8/10

Viewsonic VX2255wmb

A great screen for home or office.

Viewsonic
www.viewsonic.com.au
$329

All in one; image quality: bang for buck. ✔

No HDCP support; no portrait rotation. ✖

SPECIAL FEATURES *i*
1,680 x 1,050 resolution
5ms response time
Inbuilt speakers

There are so many different LCD monitors on the market these days it's hard to know which to buy. Viewsonic's VX2255wmb is an attractive screen that includes an integrated webcam, microphone and speakers making it worthy of consideration for your office or home workstation.

There's plenty of height and tilt adjustment so you can place the screen in an ergonomically suitable position. The maximum resolution of 1,680 x 1,050 is common for 22in displays and is adequate for most tasks. Office productivity applications, web browsing and email all worked well with text and images being rendered clearly. Rated at 5ms, the VX2255wmb was able to keep up with fast-moving sequences from the DVDs we tested. It's worth noting that the DVI-D connector does not support HDCP. Sound from the speakers was OK for the occasional beep but otherwise you'll want to stick with external speakers.

Benchmarking with Passmark's MonitorTest revealed that curves and diagonals rendered with minimal jaggedness and colours didn't bleed into each other. These results reflect our real-world testing — the VX2255wmb is a very competent display.

Viewsonic's dead pixel policy starts with zero tolerance if a dead pixel occurs within 30 days of purchase.

We couldn't find any major problems with the VX2255wmb. It provides good colour and clarity, and the integrated webcam and speakers work well and help reduce desktop clutter.

Anthony Caruana

7/10

Sony Bravia KDL-52EX1

Remove the clutter from your room.

Sony
www.sony.com.au
$7,099

Great SD and HD TV; looks great. ✔

Very expensive; mediocre Blu-ray playback; needs a huge room to be worthwhile. ✖

SPECIAL FEATURES *i*
Wireless functionality
Bravia Engine 2
LED backlighting

The EX1's body is super-svelte at 56mm thick and has a stylish, white 'picture frame' bezel. The picture is beamed from a wireless transmitter box using a 60GHz signal that has a range of 20 metres.

In terms of quality the EX1 is a mixed bag: blacks are truly black thanks to LED backlighting; details are preserved in dark and bright areas; colours are natural; and the 100MHz 'Motionflow' keeps objects moving smoothly. However, in our HD noise test there was a little too much noise in our slightly-moving HD image. Also, it struggled in the de-interlacing test when our ultrafine test pattern was moving. The wireless signal may support 1080p but it doesn't support native 1080p/24 Blu-ray playback.

These are all very high-end concerns. Most people watching this TV will dismiss the picture quality as 'stunning'. Sony's new Bravia Engine 2 is still superb at upscaling both SD TV and DVDs. There's still some noise and some edges get a bit soft, but for a 52in TV it's very impressive.

A full complement of connectivity options is available with three HDMI ports on the transmitter, but only one each of component, composite and S-Video. Sound comes through two 7W speakers and is well-rounded. Still, 46in wired Bravias offer great quality at half the price.

Nick Ross

8/10

Logitech Harmony 1100i

There can be only one.

Logitech
www.logitech.com
$899

Easy to use; looks great.

Some reliability issues.

SPECIAL FEATURES
3.5in touchscreen
Online database
Task-focused UI

With the increasing complexity of lounge-room AV set ups, we've become inundated with more remotes than you can poke a stick at. Every time a new remote is added to the rig, complexity increases — until now. Logitech's flagship universal remote — the Harmony 1100i — sports a 3.5in touchscreen that does away with device-centric control in preference to guiding you through specific activities.

We tested the Harmony 1100i in the toughest conditions possible: the family lounge-room. Our AV setup includes a Sony Blu-ray player, Panasonic LCD TV, Sony amplifier, a Wii and an Apple TV. We told the Harmony Remote software which specific models we were using and it used its online database of 225,000 devices from more than 5,000 manufacturers to program the remote. We then followed a wizard-driven process that guided us, using plain-English questions, to program specific activities like "Watch a Movie" or "Listen to Music". This is the Harmony's strength: rather than simply toggling between different devices the remote is task-focused.

For example, to watch a DVD, we programmed the Harmony 1100i to power on the amp, TV and Blu-ray player and configured the volume to be controlled by the amp, set the TV set to the correct HDMI input and the five-way button on the unit to navigate the movie menus.

The configuration was then sent to the remote via USB. Our only problem was that some of the configuration wasn't quite right the first time around and rectifying issues was a little fiddly.

There are many people who couldn't justify $900 for a remote, but if you've invested thousands in high-tech home automation and an AV system, then a remote that integrates all the components is a worthwhile investment.

Anthony Caruana

8/10

Sanyo PLV-Z3000 Front Projector

Still a top-shelf projector.

Sanyo
www.sanyo.com.au
$4,999

Same great image quality; great price; no motion judder.

It's not a massive leap in performance above the Z2000; costs a whole lot more than a Z2000.

SPECIAL FEATURES
5:5 pulldown
Smooth Motion

Setting new standards for 1080p image quality at prices that didn't require rock star salaries, it seemed like the Z2000 could do no wrong. Yet now that we've spent some time with its successor, the PLV-Z3000, we've identified a major issue with the Z2000. It's too perfect.

The Z3000 looks identical to the older Z2000, it has the same handy powered sliding door that covers the lens, the case also has the ever handy dust cleaning ports. The Z3000 is just as silent as its older sibling, as well as having the Z2000's lens shift, a godsend for folks who can't fit it in the centre of the room.

The remote is identical; it's not the slickest IR stick we've ever seen, but it does the job ably. The menu is almost identical, but with a couple of new options. For novices, the basics of brightness and contrast are easy to find, with a scary level of tweaking buried deep within if you've got a penchant for service manuals.

In image quality terms, the Z3000 struggles. It's not that the 2.5-metre image on our test screen looked bad at all; anything but. The Z3000 pumps out a glorious image, with beautiful brightness, contrast and colour reproduction. But so does the Z2000, at around half the cost.

The major overhaul for the Z3000 is the inclusion of 5:5 pulldown (a feature that is irrelevant to us PAL customers, as it only enhances NTSC flicks) and Smooth Motion, both of which eliminate motion judder. During our testing, enabling Smooth Motion removed this entirely, but impacted the lip synching between the video and audio, as it creates a small processing delay.

For users on a moderate budget, it's a tough one. If you can afford another grand with ease, go for the newer model and enjoy your smooth panning and slightly brighter whites. But if not, the Z2000 is hard to go past, especially at the bargain basement prices it can be found at today.

Bennett Ring

9/10

Sony Handycam HDR-CX100E

Sony Australia
www.sony.com.au
$1,199

Great value; memory stick; oozes quality; touchscreen. ✔

Only standard stereo sound. ✖

APC MAGAZINE apc EDITOR'S CHOICE

Sony transplants the Exmor CMOS sensor from its popular range of DSLRs to the CX100 handycam to give great-quality 1,920 x 1,080 HD resolution video and sharp 4MP still photo image capture.

8GB of inbuilt memory allows for three hours of HD recording with the option to add more space with the CX100's Memory Stick Duo compatibility. This combination offers one of the most user-friendly systems as far as getting your footage from your camera to your PC for editing or transferring to DVD.

Face recognition and smile shutter modes allow the CX100 to automatically take still photos while recording video. As soon as it sees a face in the scene smile, the CX100 will automatically take a still photo, giving you the best of both worlds.

The 2.7in LCD touchscreen display allows users to set focusing and metering points and makes accessing modes simple without having to navigate traditional menus. High-quality images and ease of use make the CX100 a winner.

Christopher Zammit

7/10

Sony Handycam DCR-SR47/R

Sony Australia
www.sony.com.au
$749

Good for basic users; 60GB drive; 60x zoom! ✔

Only standard-def; poor low light images; poor still images. ✖

It's amazing how quickly you can get accustomed to viewing life in HD. You almost forget that standard definition camcorders still exist, then along comes the Sony SR47. If you're simply after a camcorder to shoot video of the kids or to have something compact handy for family outings, then this will do the job nicely.

Although the image quality is technically inferior compared to HD models, the SR47 still produces a damn clear image in good light. Colour reproduction is good although a bit muted without Sony's colour-enhancing features found in the HD models. The main drawback to the SR47's image quality is the poor reproduction of dimly lit areas and night scenes. The onboard sensor simply isn't fine enough to handle this without noise. On the plus side, it has an amazing 60 times zoom that is better than many HD rivals. Pair that with a 60GB hard drive and the appeal of this tiny unit becomes apparent.

That said, this is a good camcorder if you only want the basics.

Christopher Zammit

8/10

Panasonic HDD Hybrid HDC-HS20-K

Panasonic
www.panasonic.com.au
$1,649

Full 1,920 x 1,080 HD; touchscreen; huge 80GB HDD. ✔

Screen can be a little hard to read in daylight. ✖

APC MAGAZINE apc HIGHLY RECOMMENDED

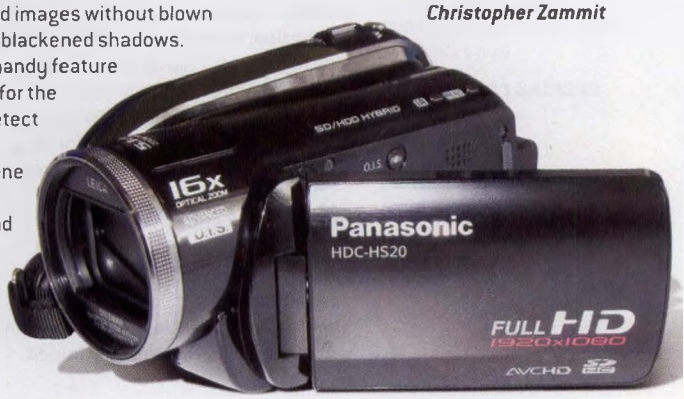
Here's a pocket-rocket of a camcorder that shoots full HD with 5.1 surround sound for under $1,700.

The Hybrid element of this camera refers to its ability to store video on either the huge 80GB hard drive or on an optional SD card if more space is needed. A conventional-looking body hides a few innovations such as true surround sound in which five separate microphones work together to give greater sound separation. A decent 16x zoom and intelligent exposure modes produce great-quality video images in full 1,920 x 1,080 resolution.

Touchscreen controls allow the user to choose which part of the scene they want to focus/expose for, ensuring that the main subject of the video is always sharp and well lit. Face detection and intelligent contrast control work together to deliver well-balanced images without blown highlights or blackened shadows.

Another handy feature is the ability for the camera to detect zooming, panning, scene changes, increases and decreases in sound level, and it finds faces to instantly produce a highlights reel for fast viewing. With high-quality images and an idiot-proof control system, you could do far worse than the HS20.

Christopher Zammit



7/10 Canon Powershot A480

Just the basics for the beginner.

Canon Australia
www.canon.com.au
$199

Cheap; nice, solid body; decent images for price. ✔

LCD is hard to see; plastic buttons; not rechargeable! ✖

SPECIAL FEATURES
10 megapixels
2.5in LCD
Face detection
Video with sound

We're not going to pretend that the A480 is anything other than a simple, cheap compact camera. Canon gives you you're money's worth with this one... just.

As long as you're not into sports photography or don't want to take a lot of pictures in a hurry, the A480's 10MP sensor captures images that are adequate for everyday use. Time between shots can be frustratingly slow, especially when you get the flash involved. The A480 has to have one of the slowest flash recycle rates we've seen.

Accurate colour reproduction and good saturation make up for images that can be a little flat in the contrast department at times. Focusing seems to be centre-weighted, so images can get a tad fuzzy toward the edges (though not enough to be an issue).

You do get some good features for the price, though. The now-standard, face detection, red-eye correction and motion detection technology help you get the most out of the CMOS sensor, while a selection of 15 shooting modes make the A480 a breeze to use. If you want a little more control, the ISO, white balance, picture modes and metering mode can be manually adjusted.

As an added bonus, standard-def VGA video is also included.

If you want something basic for taking the casual snap, the Powershot A480 will do the trick. But if you have the cash we recommend you go for something like the IXUS 95IS instead.

Christopher Zammit

8/10 Nikon Coolpix S60

iCamera, when two buttons are all you need.

Nikon Australia
www.nikon.com.au
$549

Beautiful 3.5in touchscreen; interface; Lithium-ion battery. ✔

A bit too pricey. ✖

SPECIAL FEATURES
3.5in touchscreen
iPhone-like controls
10 megapixels
Vibration reduction
Smile detection

With only two buttons on the S60, you can be forgiven for feeling a little confused when you first pick it up. The power and shutter buttons are easily identified at the top of the camera but everything else is gone. All controls have been moved onto a huge 3.5 inch iPhone-like touchscreen that occupies the entire rear panel of the camera.

The new menus are easy to use and very intuitive, with everything where you would expect to find it. The image preview mode has a real iPhone feel to it as you literally flick through your images with your fingers or the included stylus.

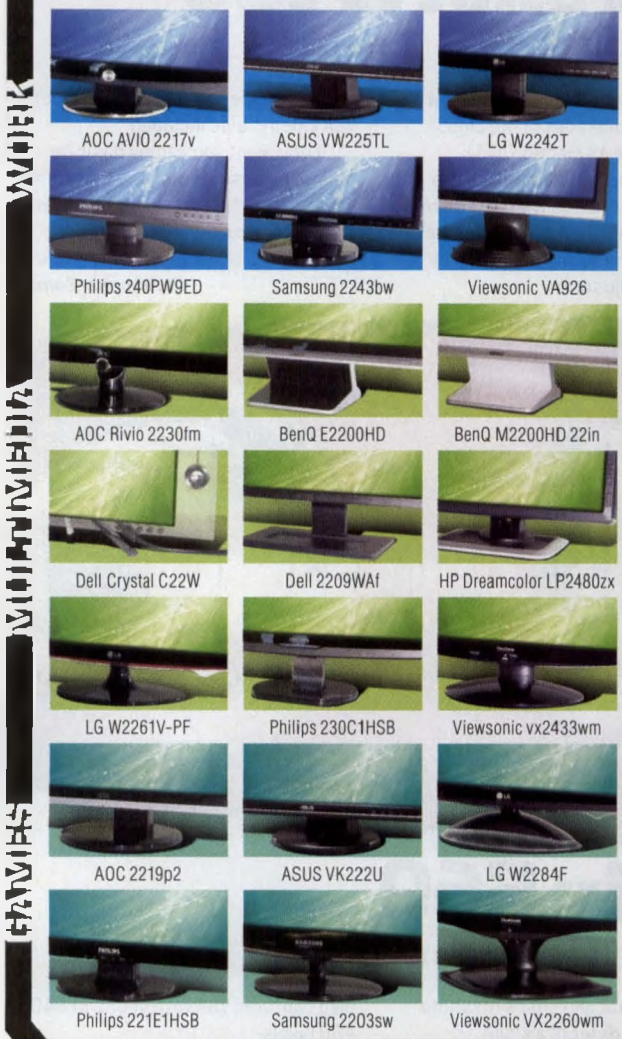
The 10-megapixel sensor takes beautiful photos that live up to the quality expected from the Nikon brand. Vibration reduction works optically to give sharper pictures at even the most extreme zoom range (5x). Like Canon, Nikon has developed its own version of smile recognition called Smile Timer that automatically snaps off shots whenever it detects a smile.

The only drawback to image quality is the poor performance of low-light pics at anything over 800 ISO. This is a problem considering it has a top range of 3200. If you're into video, the S60 also captures VGA with sound at 640 x 480 pixels.

The S60 is a great camera, with cool navigation and controls that have jacked up the price. This really should be a bit cheaper for what it is.

Christopher Zammit

UNDER REVIEW



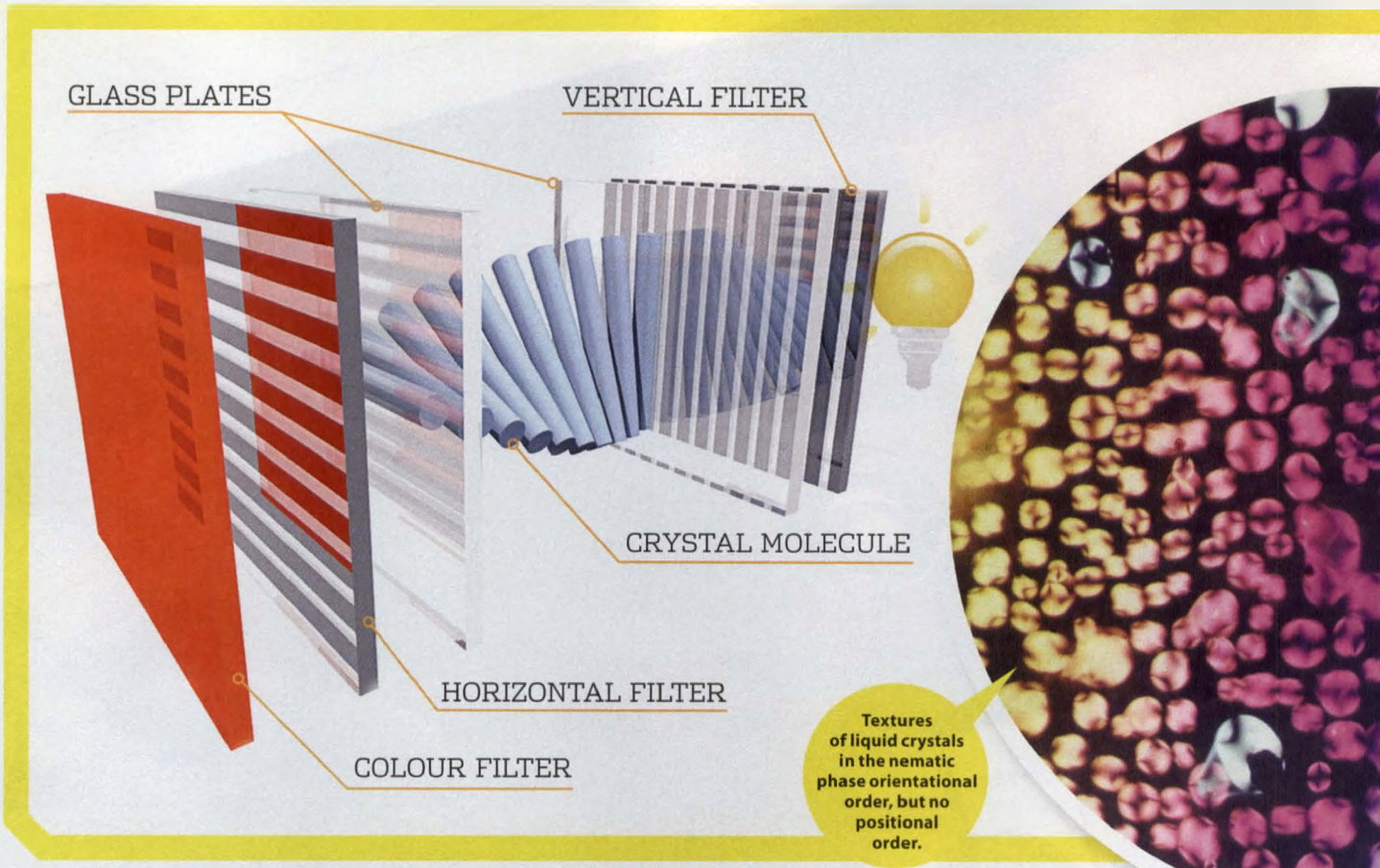
SCREEN TESTS

Nick Race looks at the best widescreen LCDs for work, rest and play.

LCD monitors are on nearly every desk in the country, and with good reason. They're lighter, consume less power, run with higher resolutions and are arguably better for the environment than old CRTs.

We've tested more than 20 of the latest and greatest LCD PC monitors from all comers and we tell you which is best. But we're so fascinated by LCDs that we're also going to tell you a story — what liquid crystal is, where it came from, how it works and just how all the elements come together to make an LCD monitor.

We told the LCD vendors we wanted to see a work, multimedia or gaming monitor, or one in each category. This left it up to the vendor to pick and choose which they'd send to us for testing. As a result, we ended up with a pretty good bunch over all, with no real stinkers.



Textures of liquid crystals in the nematic phase orientational order, but no positional order.

THE TECH BEHIND THE SCREENS ON TEST

An LCD monitor at the highest level works with variously polarised light. If we remember from high school, the direction of the wave component of light can be adjusted using polarised filters. If you also recall that putting two polarised filters at 90 degrees to each other blocks all the light coming through, then we're on the same page. If you feel you need a quick experimental refresher, hunt around for two pairs of polarised sunglasses. If you put the lenses of two pairs together at the same orientation, you can see through just fine. When you start changing the orientation of the lenses (filters) relative to each other, it begins to (and then completely) blocks the light from coming through.

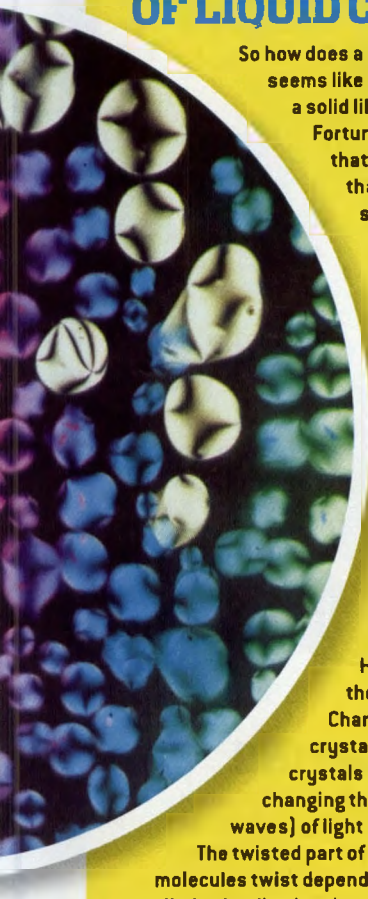
Every pixel of an LCD monitor is made up of three subpixels in red, green and blue. The colour layer itself doesn't change at all; it's essentially a mask over a layer of liquid crystal and polarising filters. To create a specific colour for a pixel the liquid crystal behind each subpixel is activated a specific amount, which allows light through from the backlight and combines to give a specific colour over a whole pixel. The resolution of a monitor is the number of pixels found on the screen measured horizontally and vertically. A 22in monitor can have a resolution of 1,680 x 1,050, a stack of pixels 1,680 units high and 1,050 pixels across for a total of 1,764,000 pixels or 5,292,000 red, green and blue subpixels. Each subpixel is independently addressable, and they make up the image on the screen as a whole.

The real trick to an LCD monitor is the number of colours it's able to display. A screen's gamut is limited by the number of levels of intensity that the subpixels can display. For example, a "full colour" gamut of 255 levels of intensity for the subpixels allows over 16.7 million different colours to be displayed on screen. Older LCD monitors don't offer the same amount of colours as nearly all newer LCDs, as they offered less discrete levels of intensity at the subpixel level. It also drives home just how complex a device an LCD panel is.

Each subpixel is essentially an independent operator. At this level, the screen is relatively basic. From back to front, a subpixel on an LCD panel is made up of a number of elements all sandwiched together. First is a light source, called the back light, either a Cold Cathode Fluorescent Light (CCFL) or more recently a Light Emitting Diode (LED) array. All LCDs include a back light, as liquid crystal itself doesn't generate any light (or have any particular colour for that matter). Next up is a polarising filter, which aligns the light coming from the back light. Squeezed between two see through electrodes is the liquid crystal. With no current being applied to it the liquid crystal allows the light through without changing its polarisation. Last but not least is another layer of polarising filter. The inner and outer filters are at 90 degrees to each other, and in its default state don't allow any of the light from the back light through — giving us a black screen.

Now, to light up one of these subpixels, let's say to half its brightness, a small amount of current is passed between the electrodes containing the liquid crystal. With the application of current, the molecules in the liquid begin to twist. As the light waves from the back light pass through the liquid crystal, its polarisation is changed (in this case, at half intensity it would be at 45 degrees). As the light passes through the outer polarisation filter, around 50% of it will be blocked and we get a half intensity subpixel. With different levels of current applied to the liquid crystal, we get the variable amounts of light allowed to shine through each subpixel. Combine the colours from the subpixels into a greater whole and voila! We have an LCD panel.

THE SCIENCE OF LIQUID CRYSTALS



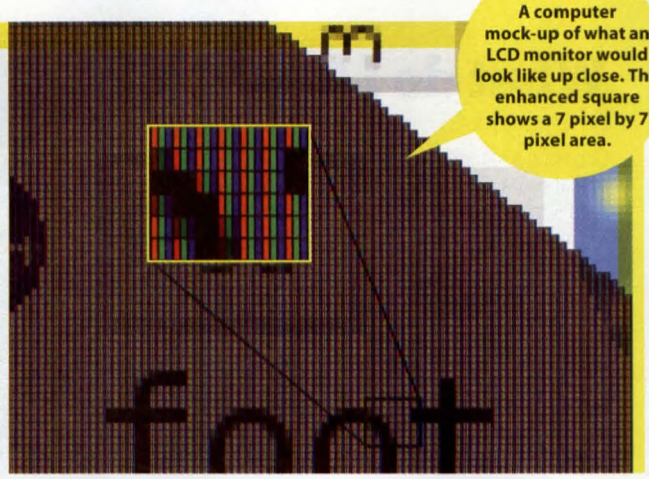
So how does a liquid crystal work? Liquid crystal seems like a contradiction. Something shouldn't be a solid like a crystal and a liquid at the same time. Fortunately, there are a number of substances that can do exactly that, sitting in a state that acts like both a solid and liquid simultaneously.

The distinction between the two states is that in solids the molecules are ordered rigidly and cannot move throughout the substance. In liquids, the molecules move about in all dimensions, making things a lot more fluid. In the liquid crystal we put to use in LCDs, the molecules are free to move about, as in a liquid, but they retain their orientation, all pointing in the same direction, just like molecules in a solid. This property is called nematics.

The liquid crystal used in LCDs also need another important property; they need to react to electric current. How they react to that current is where the usefulness comes in. The discovery by Charles-Victor Mauguin of twisted nematic crystals was a breakthrough. Twisted nematic crystals (TN crystals) have the property of changing the polarisation (the orientation of the waves) of light as it passes through the liquid crystal. The twisted part of the name comes from the fact that the molecules twist depending on how much electric current is applied to it, allowing the polarisation to be changed.

Liquid crystals can be frozen (turned in to a true solid) or melted (turned in to a true liquid) often with very small temperature changes. So the ones of most use to us in displays are the ones that are quite happy in their liquid crystal state at room temperature but have the nematic property and react to small changes in electrical current. And, for those wondering, from what we could find out, most modern LCDs use cyanophenylcyclohexanes (from George Gray's family of stable liquid crystals) as their substance of choice.

All of these building blocks allow us to play with light sufficiently to build a modern LCD monitor.



A computer mock-up of what an LCD monitor would look like up close. The enhanced square shows a 7 pixel by 7 pixel area.

HISTORY OF LCD

Liquid crystal displays have a much longer history than you might imagine. The first discovery of liquid crystal was by a botanist by the name of Friedrich Reinitzer from the Charles University of Prague in 1888. He wasn't looking for new forms of matter, but was investigating different types of cholesterol extracted from carrots. He discovered that cholesteryl benzoate seemed to have two melting points: at first becoming a cloudy liquid at one temperature, then clear at a higher temperature. The cloudy phase in the middle was a liquid crystal state, halfway in between a liquid and solid and having some of the properties of both.

A chemist Richard Williams at RCA Laboratories began looking into liquid crystals for use with display technologies in 1962, but was limited by materials that didn't meet the requirements for a low-voltage, low-temperature and low-cost solution.

In 1964 Louis Zanoni and Lucian Barton discovered liquid crystal substances that could switch between transparent and opaque with the application of electricity and workmates Joseph Castellano and Joel Goldmacher discovered some liquid crystals that worked at room temperature. In 1968, RCA Laboratories announced the first liquid crystal displays.

The next big jump came in 1969, with a gentleman by the name of Hans Kelker who discovered a substance called N-(4-Methoxybenzylidene)-4-butylaniline (MBBA), which was liquid crystal at room temperature and was easy to work with, which allowed much more research into the strange property.

Shortly after, George Gray manufactured the first chemically stable liquid crystals usable at room temperatures and the tools for the modern LCD was born.

What do I look for?

In a good LCD monitor. . .

Choosing a monitor that suits your needs isn't as simple as it appears. Apart from the important pricing factor, you need to choose the features that will fulfil the tasks that you will most often set it. Multimedia monitors and gaming monitors have many of the same features, while work monitors are often simpler.

OSD
A comprehensive menu system and presets for different usage models can make a good monitor great.

RESOLUTION
If you're planning on getting the best video experience, you need a minimum of 1,080 vertical pixels in the display.

CONNECTIVITY
Most screens come with DVI and D-Sub (VGA). HDMI is handy for connecting games consoles and Blu-ray/DVD players.

UNIFORMITY
Check that the backlight is uniform across the whole screen, and not brighter or darker in the corners.

STAND
An adjustable stand can be a handy thing to have for your own comfort, especially if you spend long stints at the screen.

BUYING AN LCD

If a new LCD monitor is on the cards, there are some things that a wise buyer should look out for. The first step is to decide on your usage model. This will then let you set a budget and look for certain things in the monitor that will let you make the best decision. We've split these monitors into three main categories: work, gaming and multimedia-centric models.

We used the term work monitors rather than business monitors, as we're evaluating them from the perspective of a standard PC "worker". This is really the bulk of users: budget-conscious, internet browsing, word processing or coding, without the bells and whistles of other specialty monitor types. A small aside is made here for professional-style monitors as well. These tend to focus on being colour-accurate and include functionality to match various settings for different software packages. These are primarily for designers, artists and high-end video enthusiasts or professionals who rely on the colour accuracy of their monitors for their end product.

Multimedia monitors are for the video enthusiasts. Whether that's watching video content or making your own, these screens are optimised for video playback. Specifically, these screens will have a good performance with refresh rate, a widescreen format, including 16:9 video ratio, connectivity to support external video devices, most usually HDMI and occasionally component video or DisplayPort and big, vibrant colours.

Gaming monitors are most similar to the multimedia style. They tend to be widescreen, have very fast pixel-response times, and most of them pack an HDMI port for console gaming. These are also more likely to have slightly less vibrant screens, as the priority is put on making them fast.

Once you've picked the camp you're buying for, establish your budget, then go and check them out. Getting some eyes on time in a computer retailer or big box store is the best way to get a good handle on what to expect from your monitor. Don't be afraid to get hands-on either.

OUR TESTING

APC's testing methodology consists of a number of discrete tests using different sources to highlight key points and point out deficiencies in an LCD monitor's performance. We use DisplayMate to establish colour accuracy, colour stepping and backlight issues.

Next is a video test, using 1,920 x 1,080 H.264 encoded high-definition test video, which includes scenes particular gruelling to LCDs. This includes sideways and diagonal panning for jaggedness evaluation, fast-moving high-detail high-contrast content for picking up ghosting and dark-detail scenes to evaluate the monitor's capability to reproduce detail in dark areas. We also use a pattern generation application to test for Moire issues (visible movement in fine patterns that can be quite distracting): thankfully something that's much less common than it used to be.

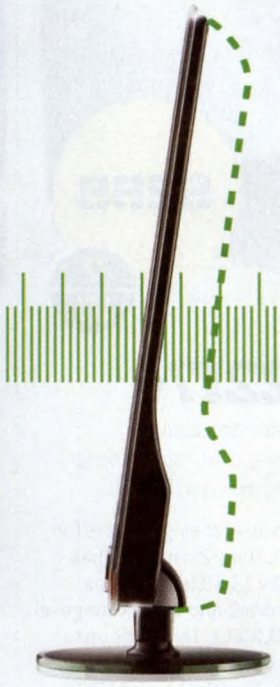
Last but not least we use the built-in GPU benchmark in Crysis to give us a feeling of how a monitor performs when playing a game. This demo also has the benefit of having some very bright, and very dark areas with lots of detail.

AOC

Verfino

The Slimmest
WLED Monitor
In The World

18.5mm



Very Slim. Very Green. Very Verfino!

SLIM • The World's Slimmest WLED Monitor

GREEN • A "Green" Monitor: Low Power, Hg Free & Green Packaging

CRYSTAL CLEAR • Ultra high Dynamic Contrast Ratio (100000:1)

LUXURY • High-gloss Translucent Deco & Luxury Wine-glass Base

MULTI FUNCTIONAL • HDMI plus Webcam & Microphone

Australia: COMPUCON www.compucon.com.au | TODAYTECH www.todaytech.com.au

New Zealand: INGRAM MICRO www.ingrammicro.co.nz | Morning Star www.morningstar.co.nz

www.aoc.com

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MONITORS FOR WORK

AOC AVIO 2217v

@ www.aocmonitor-anz.com
✔ Decent screen quality; good industrial design.
✖ No adjustable stand; bizarre menu interface.

AOC's 2217v ticks a lot of the right boxes for a good work screen. This 22in monitor has the standard 1,680 x 1,050 resolution, a brightness of 300cd/m2 and a 'marketingese' contrast radio of 10,000:1. That adds up to a good, bright image suitable for brighter work environments. There's the usual DVI and D-Sub interfaces, which is sufficient for a workplace screen, and the only thing on the wishlist is an adjustable stand. What sets it aside is the monitor's menu interface. It's truly bizarre. Though AOC claims it's more user-friendly than the usual interface, in our opinion it's a bit cryptic, replacing menu items with images a-la a mobile phone. It does give you a text listing as well, which poses the question; what's the advantage if you need to read it anyway? Beyond that strangeness, the menu works well, and adjusting the screen for your own usage and comfort is quite easily done using the brushed aluminium wheel-like menu button. Screen testing was good, though there was some light bleeding along the bottom of the screen that could foreseeably throw up a slight reflection. The screen's vibrancy and colour accuracy was within the bounds of what we expect. Turning down the screen brightness didn't wash out the colours too much either, making it comfortable to use for extended periods.

ASUS VW225TL

@ www.asus.com.au
✔ Adjustable stand; nice & bright; good action testing.
✖ Some light bleed; murky in dark detail.

The ASUS vw225tl is astounding in its mediocrity. That's not to say it's bad or to be discounted, but when it comes to nearly every aspect of this screen, it just gets by. It sports single DVI and D-Sub ports. The image quality is good without being great, with the screen murking out in the darker areas of our test screens. ASUS's "Splendid" presets leave something to be desired, with very bright settings that work well on a showroom floor but tend to wash out too much when you put it to serious use. The good news is that you can dial it back using manual settings, but you have to do away with the Splendid settings altogether. There's also some fairly obvious light bleeding at the bottom of the screen. Our motion tests showed some good results. The screen was nice and smooth in fast action scenes, with little in the way of tearing or jaggies, though there was some slight ghosting issues for white/black transitions. The good news is that on a desk in a work environment, the ASUS vw225tl will do just fine. The brightness can be ramped to battle the inevitable fluoro lighting and the adjustable stand will be a godsend for work comfort. The built-in speakers will also do fine for work use. All said, the ASUS vw225tl is a competent monitor with a few faults; not terrible by any stretch, just mediocre.

LG W2242T 22in

@ www.lge.com.au
✔ Good image quality; comfortable to use.
✖ Non adjustable stand.

A work screen is something that you need to be comfortable staring at for hours (with, of course, the requisite OH&S mandated breaks to rest your eyes regularly). Thankfully, the LG W2242T is a monitor that I could see myself using on a day-to-day basis in the Labs. It's easy on the eyes. Too bad my neck couldn't say the same. Put through our battery of tests, the LGW2242T had a relatively easy time of it. Our movie tests showed good detail in dark areas and not an unacceptable level of ghosting and jaggies for a non-multimedia model. (We think LG's FLATRON Engine has a lot to do with that). Other tests showed the monitor capable of reproducing good colour separation down into dark levels, and with some adjustment (in the quite-usable on-screen display) we got a good desktop image out of it. Turning the brightness down to save eye stress still maintained some good colour reproduction; just what we wanted. As a work screen, inputs are limited to DVI and D-Sub and there's not a shoddy quality speaker in sight. All in all, it's a straightforward screen that does what it says on the box. There is one note of disappointment in this melody of workplace bliss; the lack of adjustable stand. With only tilt in its skill set it might not suit everyone out of the box. It's nothing that can't be fixed with a ream of paper, however.

MONITORS FOR WORK

Philips 240PW9ED

@ www.philips.com.au
✔ Good colour accuracy; great-looking image.
✖ Only DVI & D-Sub inputs; ghosting on fast images.

This 24in pro workhorse from Philips is the sleeper hit from this roundup. Coming in at $3,000 cheaper than the Pro HP monitor, it's quite a steal. Saying that, the HP is still in a different league as far as features go, but for someone who relies on the accuracy of their monitor, they could do far worse than the 240PW9ED. Designed for use by graphic designers, this screen boasts a 102% NTSC colour gamut. What that means is that it's capable of reproducing more than the number of colours found in the standard NTSC colour palette, offering the user a better representation. Even better is the SmartControl II system, built into the monitor. SmartControl II guides you through setting up the monitor for colour calibration, brightness and contrast correctly. In our testing the 240PW9ED did a superb job. Once configured correctly, shade steppings, dark detail and colour accuracy were spot on. Video testing wasn't the best of the batch, with a small amount of ghosting noticeable. No major complaints though. The screen has a height adjustable stand and 187-degree viewing angle. If you're looking for a premium monitor for graphics or video editing, you could do much worse than the Philips 240PW9ED. And considering its price to performance, it blows many other screens out of the water.

Samsung 2243bw

@ www.samsung.com.au
✔ Good image quality; simple design; nice stand.
✖ Needs building out of the box; limited inputs

Samsung's got a generally good reputation for quality LCD monitors, and the 2243bw doesn't buck that trend. It's a quality panel with a thin bezel and on a nice stand — but it's not without its minor annoyances. The 2243bw is a 22in model running at 1,680 x 1,050 resolution with a stated 1,000:1 contrast ratio. The picture quality is clear and clean, with well graduated blacks and decent detail in dark images. It's not the best monitor on display here, but definitely at the upper end of the scale. The included MagicTune software helps you adjust the monitor to a correct image, and goes a long way toward getting the best out of the monitor. The menu buttons are marked and front mounted, helping you get started quite easily. The physical design is quite good. The monitor's stand is easily adjustable with a good motion. Somewhat amusingly, there's a fair amount of construction involved in putting it together for the first time. Don't get caught short without a Philips head screwdriver or you're in for disappointment. The panel is surrounded by a nice thin bezel, which goes a long way toward making it look quite natty. There are only two inputs, a DVI and D-Sub VGA connector. Ultimately, the Samsung 2243bw is a solid and competent monitor. A simple design and good image quality goes a long way.

Viewsonic VA926 19in

@ www.viewsonic.com.au
✔ Decent image quality for its price.
✖ 1,440 x 900 doesn't meet the HD era; stand.

Though we'd all love to work with a 24in top-notch monitor on our desks each day, it's really not that practical cost-wise. The VA926 from Viewsonic fills that gap nicely. It's inexpensive, big 'enough' at 19in, and we still get a widescreen 16:10 format. Also, we get a native 1,440 x 900 resolution out of this model. As a budget monitor, we don't tend to expect a tremendous result during our testing, with response time and colour accuracy tending to drop off the wishlist first. To its credit, Viewsonic hasn't scraped the bottom of the barrel for these panels, with the VA926 doing reasonably well in our tests. Grey scale testing showed the monitor to be reasonably good until it hit the very dark areas, where we got some banding. Picture and colour tests gave us a fairly vibrant image and, once adjusted correctly, a comfortable screen to view. The viewing angle was noticeably less than some of the more expensive models on show. Movie and gaming tests showed the VA926 reasonably capable, with some level of jaggies and ghosting, but nothing too startling. Only D-Sub and DVI connectors are available.The ViewSonic VA926 19in LCD monitor is quite capable considering its price. If you're seeking a decent, inexpensive work monitor, or one for the kids, then it's not without merit.

MONITORS FOR MULTIMEDIA

AOC Rivio 2230fm

@ www.aocmonito-anz.com
✔ Built-in media playback; good colour.
✖ No adjustable stand; fiddly media playback.

If you want flexibility, this is the monitor to get. The AOC 2230fm isn't just a 'dumb' screen for playback from your PC but a digital media player and digital photo frame (of epic proportions) in its own right. It can play back media files from the built-in card reader or USB ports from your portable media. The card slot supports SD and XD cards, MMC and MC. The menu system to access the media from card or memory stick is a bit clunky, but still usable. The image quality for the 2230fm was quite reasonable. There was a loss of detail in our grey stepping tests, but it's far from the worst we've seen. There was no noticeable ghosting or jaggies during fast motion scenes, making it well suited to it's multimedia heritage. It doesn't suffer from the light bleeding evident in the AOC 2219p2. Physically it's a fine-looking monitor. A diamond-cut back means it looks just as good from behind as the front, and the bezel is a nice glossy black with shiny silver highlights. Unfortunately, it uses a basic stand, with no height adjustment. Inputs include a D-Sub, one DVI plus HDMI for video, plus audio input for the built in speakers and a headphone jack for use during media playback. Overall the impression from this monitor is favourable: movies look good and the built-in media playback might come in handy occasionally.

BenQ E2200HD

@ www.benq.com.au
✔ Top-notch image; great design; true 1080p.
✖ The speakers are a waste of time.

The BenQ E2200HD is a multimedia-centric offering through and through. It sports single DVI, HDMI and D-Sub ports for video in. All three connections worked as expected. The physical design of the screen is a huge step forward for BenQ: it looks like a high-end piece of hardware, with a silver embellishment around the edge married with glossy piano black. This monitor is a far cry from the nondescript grey plastic shrouds we used to see adorning BenQ LCD monitors. The control buttons are side mounted, and the menu system is easy enough to navigate. Out-of-the-box settings for this monitor were pretty terrible, with washed-out colours and a blue tinge. After some minor tweaking in the menu system we were presented with a screen that really excels for flexible multimedia use. It's true 16:9, 1,920 x 1,080 resolution is designed for movie playback and the E2200HD won't disappoint. In testing, the BenQ E2200HD really shone. Blacks were dark, whites were bright and there was a minimum of tearing or juddering during playback thanks to a 2ms grey to grey response. Slight Moire was evident in some areas, but far from the worst we've seen. In other words, if you're a movie buff, or plan to play high-def console games on your PC monitor — then this is the screen to buy.

BenQ M2200HD 22in

@ www.benq.com.au
✔ Great high quality screen; USB hub and webcam.
✖ Can't get enthused over white and silver design.

The M2200HD is essentially the same monitor as the E2200HD, but it's got a trick up its sleeve: a USB hub. That's far from an original idea, but where it gets different is where one of those ports is included. Right smack bang in the top of the screen, where a webcam would sit. Funnily enough, BenQ also include a 2MP webcam designed to sit in that exact slot. There's no restriction on plugging your own webcam in to the port if you require extra features or a higher resolution. Like the E2200HD, this screen is a native 16:9 running at 1,920 x 1,080 (it's true high definition) and includes the same video connectors: DVI, D-Sub and HDMI 1.3. The screen has built-in speakers, but they are probably better left alone if you have a choice. The same high image quality comes through the M2200HD — stunning. And while I may get jumped on by a legion of Apple branded fanboys, I find that glossy white plastic is possibly the worst surround for a screen designed for watching movies — it's a distraction and it reflects in low light. So, in our book, there's a positive and a negative with this model over the E2200HD. On the upside, the USB hub and nifty webcam slot are a pleasant addition. On the down, the screen's shiny white façade detracts, and this is a multimedia screen after all. What price, fashion?

MONITORS FOR MULTIMEDIA

Dell Crystal C22W 22in

7/10

@ www.dell.com.au
✔ Razor edge design; quality panel; good colours.
✖ Very reflective; not sold on the single cable.

It certainly has a unique look. A large plate of tempered glass acts as the front and sides of the monitor in a single pane, while housing the menu buttons and the wiring of four mini speaker tweeters. It turns heads, though we got a mixed reaction from some. It's a love it or hate it design. Beyond the superficial, the Dell Crystal is actually a pretty good monitor. The panel is quite bright (perhaps emphasised by its surroundings) and the picture quality is great. Video tests showed the screen had very little in the way of image errors, almost no ghosting and the backlight was clean and consistent. Once we turned off the LCD response time "Overdrive" the colour response of the screen improved, so switching it on or off depending on your content might be in order. The menu system is comprehensive, if a little sluggish and the capacitive buttons on the front of the monitor work just fine. There are a few things we'd pick on though. It's single cable design includes HDMI, power, a USB connection for the built in web cam and an audio out for a sub woofer in a multi-headed hydra cable. All well and good unless you hang the external power adaptor off the desk, in which case it unplugs itself. Secondly the single piece of glass design acts like a mirror when dealing with dark scenes, which is pretty distracting at times.

Dell 2209WAf 22in

9/10

@ www.dell.com.au
✔ Great screen quality; great stand; clear and bright.
✖ Reflection of the bezels; poor default settings.

Dell's reputation for bringing top-quality premium monitors to market is fulfilled in this model. And you don't even need to buy a 27in or 30in model to get the best. The 2209WAf from Dell is ostensibly a business-oriented multimedia monitor. This one is designed to sit attached to a workstation for video and graphics geeks, 3D designers, CAD workers or anyone who needs a monitor to make their work look as good as possible. Where it will better sit is on the desk of home video enthusiasts, gamer geeks or anyone who can appreciate the finer aspects of a high-quality monitor. The Dell 2209WAf breezed through out benchmarks, showing all 255 steps in gradient tests, while playback tests had us thinking we were on the Serengeti with the gazelle. Moire is minimal and overall, it's a joy to stare at. The menu system is on screen, changing the function of the four side-mounted buttons as required. There are default profiles for video and multimedia uses, but ignore them, as they're inappropriate. Physically, the Dell 2209WAf has a simple design, but a deep inset bezel casts a white reflection (a little annoying). There's a built-in USB hub and VGA and DVI connectors. The stand is excellent, with height, tilt and swivel adjustments. Overall, a great monitor, but configure it yourself.

HP Dreamcolor

9/10

@ www.hp.com.au
✔ Pro quality; 30-bit screen; a designer's dream.
✖ Needs other hardware to support it.

What do you do when you want to service an industry leader, but you don't have any products 'good enough'? The smart money is on R&D. DreamWorks needed an LCD monitor that had just as good colour reproduction as high-end CRTs, and HP stepped in to fill that niche. The end result? A 30-bit panel capable of reproducing over one billion colours. Out of the box the LP2480zx is designed to support multiple colour spaces set as industry standards or used by software vendors, like AdobeRGB and SMPTE-C. What that means is more accurate colour reproduction for various uses; what you see on screen is what you'll get in your end product. This monitor has every connector under the sun: two DVIs, one HDMI 1.3, DisplayPort 1.1, USB, component, composite and S-Video. The side-mounted menu buttons are clearly marked and allow quick switching between colour spaces as needed, or full manual adjustments if you're a maverick. A spot-on stand for adjustments is great, but the screen is very deep set — and we get reflections from the bezel. Unfortunately, to get the full blast from this monitor you need a graphics card (and software) capable of outputting a 30-bit signal, like the ATI FirePro series. Does it go? Sure. It does everything it says on the box, but you'd know if you need one.

MONITORS FOR MULTIMEDIA

LG W2261V-PF

@ www.lge.com.au
✔ Great movie nous; good design.
✖ Would have liked a few more inputs.

Getting that true crossover experience, a real cinematic feel, from a PC monitor takes a few very important key points. Firstly, a video resolution of 1,080 vertical pixels to fit a whole HD image in. Secondly, do away with letterboxing by having a true 16:9 aspect ratio for the screen. Thirdly, have a fast pixel response time to do away with ghosting, blurring and jaggies. Last but not least, good image quality in dark scenes, so you can actually see what's going on all the time. LG's W2261V ticks all of those boxes, and we're really impressed. The monitor itself sports LG's new design-oriented layout with the dewdrop power button and some fancy LED lighting, somewhat reminiscent of some older Samsung LCD TVs. On the bench the W2261V gave us a clear, clean and crisp video test, with almost no noticeable ghosting or jaggies, and a good amount of detail in dark scenes. There was very little in the way of light bleed around the edges of the screen, and all in all there's little to pick at from our testing. A 4:3 boxing function means 4:3 video is shown at the correct ratio in the centre. Standard DVI and D-Sub connectors are paired with an HDMI 1.3 port for input from DVD, Blu-ray players or consoles, and the on screen display is as useful as any we've seen. If you're a movie buff, you'd do well to consider this monitor.

Philips 230C1HSB

@ www.philips.com.au
✔ Smart response; no jaggies; 1,080 vertical res.
✖ Not sure if that extra inch justifies the price.

23in monitors aren't the most common size in the market, but this out of the ordinary screen size isn't the only thing that sets this multimedia-centric screen apart: Philips' 'SmartResponse' adjusts the pixel response time when viewing video and games, attempting to do away with the old perennial jagging and image ghosting. Conversely, it is said to give better colour saturation for static images. Our guess is that when fast moving content is on screen, it reduces the amount the LCD is allowed to twist (and thus allow light through for brighter colours), but it means it can more quickly change its state. It's not doing it any faster, just moving the start and finish lines. In practice, it works quite well. Our video and games testing showed the screen was very capable in reducing ghosting and jaggedness. Colour reproduction and grey scales all came out very clear and well stepped. This is great for those who want the most reliable image out of the monitor. Even more good news is that the multimedia aspects of the screen met our standards as well. The native resolution is a high-def 1,920 x 1,080, the built-in speakers aren't too bad, there's HDMI for plugging in other video devices and a 4:3 picture mode for viewing non-widescreen content without stretching. What more do you need?

Viewsonic vx2433wm

@ www.viewsonic.com.au
✔ 1,080 HD resolution; fast pixel response.
✖ Unfortunate stand; limited connections.

When it comes to multimedia and dual use monitors, bigger is definitely better. Usually jumping over the 22in pricing barrier can be a very expensive exercise, but in this case, the sticker shock isn't too bad. In the same vein, this isn't a top-end monitor. The stand is basic and, frankly, it looks pretty cheap. How does it work though? This 2ms panel (with a typical response of 5ms) plays games like a champ. After some initial adjustment, the colours are clear and vivid, and there's very little in the way of tearing or jaggies to ruin your fun. The backlighting could definitely be better, with bright corners fairly obvious, but not a dealbreaker. Likewise, low brightness areas turned quite murky in our tests. A word must be said for configuring your monitor correctly for the best performance. The vx2433wm has another trick up its sleeve. It's a native 1,920 x 1,080 HD screen, so those high-def movies will display correctly without black bars or rescaling. Console games and Blu-ray or DVD players can be connected directly to the built-in HDMI port. A single DVI port and audio in/out are the only other connectivity options. ViewSonic has stumped up to licence the WOW audio enhancement technology from SRS, and it shows. In a pinch the audio from the vx2433wm is punchy enough. All up, a big, inexpensive multimedia monitor.

MONITORS FOR GAMES

AOC 2219p2 22in

@ www.aocmonitor-anz.com
✔ Good stand; good price; fast response.
✖ Some light bleeding and backlighting issues.

AOC is still a brand in the making here in Australia, though they're starting to become more and more common, mostly thanks to the low asking prices and arguably better quality than the real budget brands. The 2219p2 is still a reasonably low-cost model, but it comes with an extra mostly seen on more expensive units — a fully adjustable stand. Other than that, it's a fairly basic unit, with one single DVI and D-Sub connector lineup, plus a very average set of built in stereo speakers. Image quality was good; there was little in the way of jaggies and ghosting in our test model. We did peg the 2219p2's uneven backlighting, with corners and edges brightening up quite noticeably. There's also some issue with white not being terribly white. A grey tinge to be more precise; in gaming or movie watching it wouldn't be an issue, but in Word it might be noticeable. Gaming and video tests were spot on. The screen breezed through the games, with crisp images and little jaggedness. Dark scene videos let us pick out enough detail to get by but showed some minor light bleeding and uneven backlighting to its fullest. The big question is whether we'd stump up our own dollars to take one home. This time, no — there are some slightly better choices in this price range, though the fully adjustable stand is definitely a sweetener.

ASUS VK222U 22in

@ www.asus.com.au
✔ Good gaming performance; no jaggies
✖ Preset switching needed; blown out at times.

Choosing a good gaming monitor is trickier than it looks. After all, most of the features that make a game look great and really pop are often counter to the points you look for when doing pretty much anything else with the screen. A good gaming monitor has really bright, popping colours as well as a fast refresh rate. And that's about it really. However, the VK222U is a pretty darn good gaming monitor. Fast motion and gaming tests saw it breeze through our criteria. There's very little in the way of blurring and jaggies, and things look almost as good whizzing across the screen as they do stock still. In the gaming preset, dark areas were unclear, more to do with the ramped brightness than lack of detail. The ASUS 'Splendid' technology made games look even better but noticeably less sharp. Switching from games testing to video or general usage made us switch the Splendid setting just to keep it within reasonable bounds of quality. It works, though we wouldn't be doing any graphic design on it. Video testing with preset adjustment for skin colour turned our actors reddish. ASUS also saw fit to include a built-in 1.3MP webcam into the screen's housing as an extra. The inputs are only DVI and D-Sub. All said, a pretty good gaming monitor, and does reasonably well on the desktop.

LG W2284F 22in

@ www.lge.com.au
✔ Good screen quality; interesting design choices.
✖ Another power brick to deal with; tilt only stand.

This monitor from LG is an exercise in design, adding flair to some practical requirements of the screen. In this case, the power button has been replaced with a "dewdrop" of plastic on the lower bezel, hanging below the edge of the screen. Touching the drop turns the monitor on and off (as well as acting as the power indicator light in standard IT LED blue). Similarly, the half-transparent base lights up as well, and the whole effect is quite nifty. There are a couple of trade-offs however; the base is quite shallow, which may see it being knocked over a little easily, and the ultra-thin design means it's provided with an external power brick, which adds to clutter on the desk. Our main concern, however, is the panel's quality. And in that regard LG has also done well. The panel is nice and clean, with good, vivid and bright colours, with good-quality in darker areas: minimal murk. Fast-moving images from our games video tests showed a small amount of jagging, but overall it's a good result. As a multimedia monitor, the screen doesn't quite meet the minimum 1,080 vertical resolution we like to see, coming in at a standard 1,680 x 1,050. There's some interesting modes to fiddle with, including a zoom effect, plus photo effects like sepia or monochrome accessible with a touch of a key. Useful? Perhaps not.

MONITORS FOR GAMES

Philips 221E1HSB

@ www.philips.com.au
✔ Nice bright image; good design.
✖ Speakers; slight light bleed.

The 221E1HSB from Philips lists a response time of 5ms. Compared to the 2ms blazers we've seen elsewhere, video and multimedia doesn't look too great; on paper that is. Considering that the measurement given is typically one of the faster ways to measure pixel response (rise and fall/on-off as opposed to grey to grey) we didn't have a huge hope of seeing great results out of this screen. We were wrong. This is a damn fine little gaming monitor — 22 inches of fury. Bright colours, great detail in low light scenes and only a little light leakage from around the screen. Fast-motion testing was just pipped out by some of the other screens, but it definitely sits near the top of the stack for motion performance. The 1,920 x 1,080 resolution is just fine for gaming and the HDMI connector means console gaming or DVD watching is on the cards also. The built-in speakers were loud, though not terribly good. This screen supports the 4:3 ratio switching, which is great news for retrogamers and video nuts. The physical design was also fine. A nice piano-gloss finish and hidden speakers. The bezel was also quite shallow, which helped cut down on reflection from the screen. A good try, and despite the 5ms response time marketing, it can certainly perform up to standards.

Samsung Syncmaster

@ www.samsung.com.au
✔ Good image quality; shiny.
✖ Limited connectivity; horrible stand; not full HD.

It's not often that a physical attribute of technical equipment really gives us a big turn off. Even less so when it's something that you're going to have to deal with only occasionally. In this case, it's the 2203sw's stand. It's quite possibly one of the most perplexing design choices we've ever seen in a monitor. Attaching the stand to the monitor involves popping something that looks like Katamari Damarcy's head into a rubber lined hollow in the bottom of the screen. The issue is the very, very tight fit. It took us two people and 10 minutes to get it in, and when we did, it was more a desperate wrenching than a gentle pop. The 2203sw is a great little monitor; the image quality is excellent, with detail in dark images popping out and great colour reproduction. Little sign of jaggies or motion blur and a beautiful, evenly lit screen and you're in for a joy. That's where the fun ends though. The screen is in a 16:9 format but doesn't meet the pixel count for full HD resolution. So Samsung have built a desktop screen in the same format as blockbuster movies but not packed in enough pixels to really show them off. It's a strange design choice. The issue here is the screen's size. They've chosen a 20in screen. Why not go to 22 and be done with it? For that matter, why is there no HDMI or DisplayPort?

Viewsonic VX2260wm

@ www.viewsonic.com.au
✔ Good image; no ghosting or blurring.
✖ Some slight light bleed issues.

What gamers want are large, relatively inexpensive and fast LCD monitors. The VX2260wm from ViewSonic fits those criteria like a glove. Like its big brother, this panel has some pretty good visual nous going on. Fast-moving scenes look good, crystal clear and once you load up a game, you're good to go. Adjustment on this screen is purely manual, which means you're not stuck with someone else's ideal image but need to dig in to the menu if you're picky enough to want to change the screen's parameters based on what you're doing. Out of the box it's good enough for games with a few bumps of the colour button. There's not a lot of washout on this screen, so dark areas are sufficiently detailed. Some colour steppings were a tad iffy, but overall it's a good performance. Gaming tests are where it matters, and the VX2260wm did very well. We did notice some slight light bleed issues from the top and bottom of the screen, but dropping the brightness of the screen altogether lessened its impact. Like the VX2433wm, the screen doesn't bowl us over with its industrial design, but the SRS WOW-enabled built-in speakers punch above their weight. There's D-Sub, DVI and HDMI to round it out. Essentially, the VX2260wm is a capable gaming monitor. Though it's not perfect by any stretch, it does what it says on the box.

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3 KENSINGTON DUAL MONITOR ADAPTER

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Price: $159.95.
Visit http://au.kensington.com

DIGITAL VIDEO RECORDERS

Jenneth Orantia runs a few of the latest DVRs through their paces to find that, unlike the past-generation VCRs, it's not rocket science.

If you can remember the days when TV networks used to run test patterns on the telly after hours, then you'd be well-acquainted with a charming little box called the VCR. Short for Video Cassette Recorder, it let you record shows off TV to a two- or three-hour analogue tape, provided you could master the correct sequence of buttons, settings, timing, head scratching and hair pulling that was necessary. Not an activity for the faint of heart, yet many non-techie mums and dads managed to master this complicated ritual for the sake of watching *A Country Practice* or *Hey Dad!* after the kids were tucked into bed. These days, recording TV shows has become far easier with the advent of digital video recorders, or DVRs for short. Similar in concept to the VCR, but instead of recording to a time-limited analogue tape, DVRs record digitally to a hard drive that's capable of storing from 50 to 500 hours' worth of shows. DVRs come with a built-in electronic program guide that lets you check the upcoming broadcast schedule and select the specific shows you want to record, saving you from having to puzzle over the paper TV guide and manually inputting dates and times. Nor do you have to worry about another household member coming along and changing the channel while you're recording!

UNDER REVIEW

FOXTEL iQ2

Panasonic DMR-XW350

TiVo HD

TVIX 6500

What do I look for?

In a good digital video recorder...

There are a number of things you need to factor in to your purchase of a DVR that will suit your needs. Here are the more important features to look for.

STORAGE CAPACITY

Hard drive sizes vary between DVRs; make sure there's enough on-board to record all the shows you're likely to miss in a week (at least 120GB).

TUNERS

To record two TV shows simultaneously, or watch one show while recording another, the DVR needs to have at least two built-in TV tuners. Also check that they're both HD: some of the older DVRs use one SD and one HD tuner.

SHARING

If you want to share recorded TV shows with friends or transfer older recordings once the hard drive is full, check there's an option to burn recordings to DVD or transfer files over a network, USB or eSATA connection.

HDMI

If you've got a high-definition television, make sure the DVR can output at 720p, 1080i or 1080p. Not all DVRs come with an HDMI cable in the box, so factor that into your purchasing budget.

LIVE PAUSE

Check the remote control has a prominently placed pause button. Believe it or not, not all DVRs offer the ability to pause live TV.

NETWORK

Some DVRs require a network connection to use key features. This is typically a wired Ethernet port, but a wireless option is usually available if you pay extra.

LED

An LED on the front to indicate that the DVR is recording will (help) ensure that other family members don't change the channel mid-way through your favourite TV show.

IT'S ABOUT CONVENIENCE

Rather than try to schedule your life around your favourite TV shows — most of which seem to only air when you have to work overtime or have been invited out for drinks — DVRs enable you to record the shows whenever they happen to be airing, letting you watch them at a time that's more convenient. There are typically at least two TV tuners built-in, so you can watch one channel while recording another, or even record two channels at a time — essential if one member of the household wants to watch *Desperate Housewives* while *Underbelly: Tale of Two Cities* is on.

Even if you aren't a fan of the record-now, watch-later style of viewing, the built-in hard drive lets you do something that would've been inconceivable back in the glory days of the VCR: pause live TV! You don't have to hold your bladder until the ad break comes — simply press pause on the remote control, do your business, and press play when you're comfortably installed on the couch again. Speaking of ads, you can use the same time shifting feature to bypass commercials altogether, just by pressing pause when the ad break starts, waiting a minute or two, then pressing play and fast forwarding to when the program starts again.

DVRs typically start caching live TV as soon as you press pause, letting you rewind and fast forward from that point on, but FOXTEL iQ2 and TiVo HD both auto-cache on the channel that you're currently watching, so you can press rewind any time you want. The TiVo HD actually goes a step further by auto-caching on the last two channels you've watched.

BITS AND BYTES

At the heart of every DVR is a hard drive, not unlike the ones in a PC. One of the advantages of a DVR is that you don't have to keep on buying new tapes to record shows. The hard drive, which can be anywhere from 120GB to a terabyte, can store dozens of hours' worth of programming, and most include intelligent disk management features that automatically delete older recordings once you run out of space.

But the hard drive-based system brings its own challenges, namely what to do when you've filled up the hard drive but don't want to bin any of the shows that you've recorded? If you're the sort that likes to watch the same shows and movies over and over again, or you want to be able to lend your recording of last night's episode of *Lost* to a mate, then it's certainly something worth considering when you're shopping for a DVR. FOXTEL iQ2 doesn't natively support transferring recordings onto an external medium — yet. There are ways to do it if you're handy with a DVD recorder and a SCART cable, but for now, the USB port on the back of the iQ2 box doesn't have any discernible purpose.

All of the other DVRs we reviewed let you transfer recordings to varying degrees. The TivO HD lets you transfer files to a PC (and vice versa) over the home network — and even convert them with the TiVo Desktop software so you can watch it on a portable device — but you'll have to shell out an extra two hundred dollars for the home networking package. The TVIX 6500 works more like a traditional media centre, so you can copy files to and from it just like you can on a PC. The Panasonic DMR-XW350 probably offers the best system, as it lets you copy files directly to a DVD — the medium that transferred recordings are most likely to end up on — without having to go through a PC.

THE EPG

The second equally essential ingredient in a DVR is its electronic program guide. This is the brains behind the operation, as it lets you look up the next week's worth of programming, from which you can select the shows you want to record.

EPGs are typically organised by channel and date and include rating information and a brief description of each show. Another factor worth taking into account is the connectivity that's needed for the DVR to download the EPG and any other online and interactive features. The TVIX 6500 and the Panasonic DMR-XW350 download the EPG through the standard RF antenna, so you don't need any extra connections, although the Panasonic's VIERA Cast service for YouTube and Picasa requires an Ethernet connection to the home network. Similarly, FOXTEL iQ2 downloads its EPG through the same cable or satellite connection that it uses for accessing the FOXTEL channels, but it needs to be connected to the telephone line to use any of the On Demand features like the pay-per-view movies and sporting events. TiVo HD requires a broadband network connection to download the EPG.

What the DVR actually does with the EPG varies between the different units. At a bare minimum, you can use it for scheduling recordings ahead of time, but a couple of the DVRs offer extra functionality on top. FOXTEL iQ2 and TiVo HD both let you record all of the shows of a particular program using the series link and season pass features respectively, but where the iQ2's intelligence ends, the TiVo HD is just getting started. The TiVo HD can automatically record shows that match a particular criteria (such as favourite actor, director or genre) and suggest shows that you might like based on your viewing patterns.

FOXTEL iQ2 and TiVo HD also offer a remote recording feature for scheduling recordings over the internet.

FOXTEL iQ2

Fantastic, if you can afford it.

$10 PER MONTH
(on top of regular FOXTEL subscription)

8/10

Couch potatoes with deep pockets will find it hard to look past the FOXTEL iQ2. In addition to recording both standard and high-definition free-to-air TV to a spacious 320GB hard drive, it's the only box that can natively record FOXTEL channels.

iQ2 service costs $10 a month on top of your regular FOXTEL subscription. If you aren't a FOXTEL subscriber yet, you're looking at a minimum of $50 a month to get your hands on the iQ2 box: $40 for the entry-level 'Get Started package' (which includes 33 channels) and $10 for the iQ2 service, plus a $200 upgrade fee and an installation fee if you opt for a month-to-month contract. The 320GB hard drive can fit up to 30 hours of high-definition or 90 hours of standard-definition programming, and thanks to four TV tuners on board, you can record two TV shows simultaneously while watching a third channel.

iQ2 doesn't offer any of the smart recording features found in TiVO; the most advanced thing you'll find is a series link option for taping all of the episodes of a particular show. But the expansive range of channels that are on offer means the iQ2 doesn't really need to compete on the functionality front. There's an HDMI output on the back for connecting to a high-definition television, a 7-day electronic program guide that you can use for recording TV shows ahead of time, time shifting for pausing, rewinding and fast fowarding live TV (both FOXTEL and free-to-air) and a remote recording feature that lets you schedule recordings online. There's also a USB on the back, but as yet it doesn't offer any discernible purpose. We're hoping FOXTEL will use it in the future to transfer recordings to a portable device; as it stands, there's no easy way to archive shows.

Foxtel	✔ Easy to use; lots of channels; remote recording.
@ www.foxtel.com.au	✖ Expensive; can't transfer recordings; options limited.

Panasonic DMR-XW350

Lots of features, but it's sluggish and not very user-friendly.

$1,099

6/10

Compared to the iQ2 and TiVo HD, the Panasonic DMR-WX350 is a different creature entirely. It sits between the two when it comes to storage capacity with its 250GB hard drive, and while it doesn't offer the FOXTEL channels of the iQ2 or the smart recording features of the TiVo HD, its appeal lies in the fact that it offers DVD playback and DVR functionality in the one box. The DMR-XW350 offers many features that aren't available on the other DVRs. You can transfer recordings directly to DVD, play content off SD cards and camcorders using the SDHC card slot and DV port respectively, adjust the quality settings for recordings to allow anywhere from 55 to 441 hours of recording to the hard drive, and access YouTube and Picasa via the built-in Ethernet port. Like the TVIX 6500, it's also got a USB host port for playing content directly off an external hard drive or flash drive — supported codecs include JPG, MP3 and DivX.

The DMR-XW350's main shortcoming is that it seems to do anything other than playing a DVD and live TV quite grudgingly. Launching the 7-day EPG while watching TV takes a leisurely five seconds. You get the same sluggish performance when you pause live TV, when you move to the Direct Navigator and when you access the Function Menu. Annoyingly, once you've paused Live TV, you can't access any of the DMR-XW350's other functions until you exit from the 'pause live TV' mode.

The YouTube and USB host features work well, but the fact that they're buried deep in the menu system make them seem more like afterthoughts than features in their own right. Two built-in TV tuners let you record two shows at a time, but, bizarrely, you can't play files off a USB drive while you're recording a TV show.

Panasonic	✔ DVD and DVR in one box; USB host feature; settings.
@ www.panasonic.com.au	✖ Expensive; sluggish; user interface isn't intuitive.

TiVo HD

Very smart, but limited to free-to-air.

$699

7/10

It's taken nine years for TiVo to make its way from the United States to Australia, but thus far it's received a lukewarm reception due to its incompatibility with FOXTEL (the US version is compatible with all of the cable networks). Smart recording features are what separates the TiVo from other digital video recorders, but given it only works with free-to-air SD and HD channels, it's not as impressive or appealing as what's on offer in the US.

Still, if you don't want to shell out for an expensive monthly FOXTEL subscription, TiVo HD works a treat for helping you get the most out of free-to-air television. The box has a one-off purchase price of $699, and that includes a lifetime of software updates and access to the electronic program guide. The one catch is that you need a broadband internet connection to download the EPG, games and other content.

The TiVo's smart recording features are the main reason you'd choose this DVR over the others. The standard options are available for recording shows directly from the EPG, but the WishList, Suggestions and Season Pass features ensure that you'll almost always have something good to watch regardless of what is currently showing live. Plus TiVo HD records the last 30 minutes of the last two channels you've been watching. The twin HD tuners on-board let you record two channels simultaneously, or record one channel while channel surfing. Sports fans will love the Instant Reply button, and there's also an Advance button so you can catch up to live TV.

Lack of available channels aside, the TiVo's main limitation is the paltry 160GB hard drive. Alternatively, you can transfer recordings to your PC and /or portable device with the optional home networking package ($199).

TiVo	✔ Intelligent recording; no fees; transfer recordings.
www.tivo.com.au	✖ Only free-to-air; only 160GB; need broadband.

TVIX 6500

A powerful media centre; not so good as a DVR.

$699

6/10

The TVIX 6500 is the only DVR in this roundup that makes it easy to upgrade the hard drive — so much so that it doesn't actually include one out of the box. According to the distributor, this is deliberate, to let users install their own hard drive, but it may deter those that aren't particularly tech-savvy. Nor is a TV tuner installed as standard; to equip it with the dual HD DVB-T tuner, you'll have to pay an extra $150. Throw in a 500GB hard drive and you're looking at around $930 all up.

Sounds like a lot of money and effort for a DVR, but if you've got a huge library of photos, music and movies that you'd like to play through the TV, the TVIX 6500 offers an easy way to do it. It can play a wide variety of codecs including XviD, MKV, H.264 and WMV HD at Full HD resolution (using the supplied HDMI cable), and it mounts as a standard external hard drive for transferring content to and from a computer. The TVIX 6500 can also stream files from shared folders on the network over an Ethernet connection.

If you're the type that likes to turn everything off when you're done with it, be aware — the TVIX 6500 takes nearly a minute to get to the main menu from a cold boot. The user interface is straightforward but it's not as slick as some of the other systems. Content is organised using a simple folder-based structure with filenames — even for photos and videos, where thumbnails would've been a better choice.

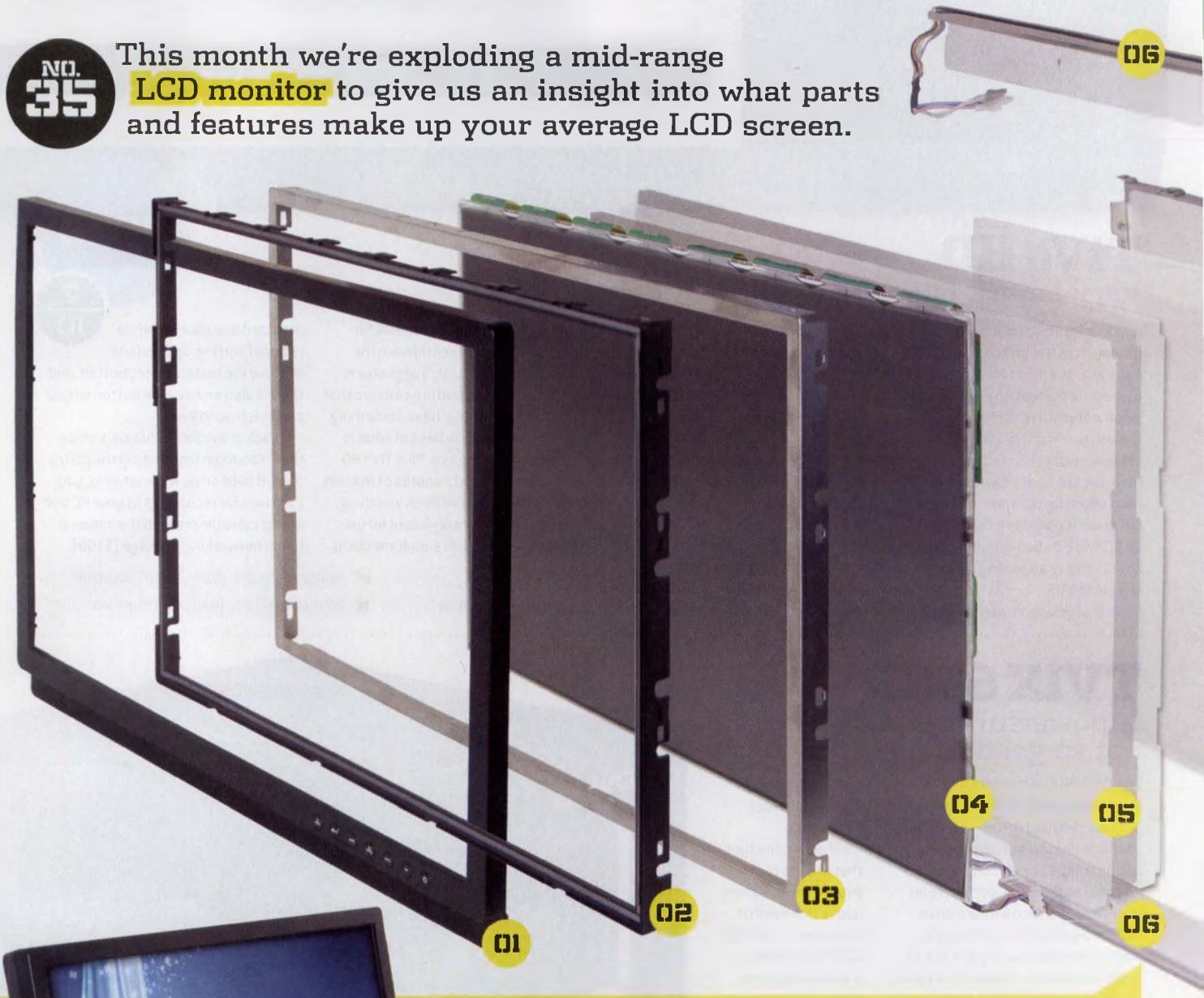
The TVIX 6500's EPG is extremely basic, with only the times and program names shown in a simple grid. You can record two shows at a time with the dual TV tuner, but timeshifting isn't supported — so no pausing, fast forwarding or rewinding.

Lako Pacific	✔ Lots of formats; networking; easy to transfer recordings.
www.lakopacific.com	✖ No timeshifting; basic user interface; slow to start up.

exploding tech

No. 35

This month we're exploding a mid-range **LCD monitor** to give us an insight into what parts and features make up your average LCD screen.



The humble LCD monitor

LCDs are ideal for simple displays that need to show the same information over and over again, such as the information displayed by computers. LCDs have always been complex pieces of technology that require the screens themselves to be made up of multiple layers of lighting, metal spacers, filters, chemicals and fiber optics to allow even light dispersion and good colour representation.

In a short time they have caught up to their CRT (Cathode Ray Tube) predecessors in terms of sharpness and image quality, as well the number and saturation of colours. LCDs have demonstrated their superiority over CRT in the areas of weight, maneuverability and size, with screens of 22 inches now being commonplace with the average user. (Something that was pretty much unheard of outside of professional studios.)

With the introduction of high-definition imaging, a high-quality LCD monitor has become a must-have for all modern computers, turning the home office into something more akin to a home theatre.

TN PANELS

TN (Twisted Nematic) panels are the most widely used panel type as they are cheap and offer excellent response times, making them perfect for fast-paced gaming. However, colour reproduction, viewing angles and contrast ratios are the worst of any LCD panel technology.

VA PANELS

VA (Vertical Alignment) technology such as S-PVA/MVA are middle-of-the-road LCD panels. They offer better colour reproduction and wider viewing angles than TN panels but have slower response times.

1 Monitor bezel featuring integrated speakers and headphone jack. In many models these features are now incorporated into the stand with the inclusion of iPod docks.
2 Spacer layer.
3 Static-proof panel shield to hold and protect the layers of the LCD.
4 VA panel featuring Vertical Alignment LCD technology for high colour and contrast ratios and wide viewing angles.
5 Thin light-diffusion layers of plastic for regulated light output.
6 High-efficiency cold cathode fluorescent tubes for consistent panel backlighting.
7 Fibre-optic layer for even light displacement.
8 Aluminum panel chassis.
9 LVDS board; interface between main board and LCD panel.
10 LVDS shield to remove EMC interference.
11 Monitor rear casing.
12 Inverter board/power-supply board; manages both light and power output.
13 Main board featuring signal processing, function control and data and audio/video interfaces; also features accelerator chip.
14 Height-adjustment monitor stand featuring auto-pivot function.

Best tech

APC's independent reviewers point to the best technologies in the top-selling product categories each month. We only change products when a better one comes along. What you see here is the best technology available on the market right now.

LOOK OUT FOR THESE

NEW

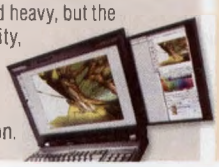
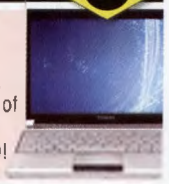
Products marked with this stamp are the latest additions to Best Tech.

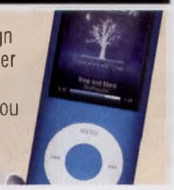
Movers & Shakers

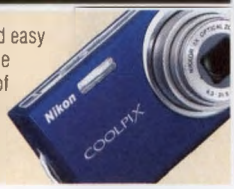
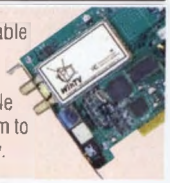
What's hot on the gear scene, for every budget.

With the iPod slowly taking over as the source of music for a generation of Australians, the ecosystem of accessories around it continues to grow. So we've added a new category, for iPod docks, iPod headphones, and iPod-compatible in-car head units. Also, PC components have now moved to our new Master Builder section on page 72.

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
GENERAL PC	**Dell Inspiron 530 E5200** If you're looking for value at the entry level, it's hard to go past Dell. And what's more, their Inspirons tend to come with special offers each month. **$1,199 > Dell > dell.com.au**	**TI Deluxe Phenom 810** Great-value system offering both 2D power and 3D performance. This is a PC that is genuinely better value than any Core i7-based machine we've yet seen. Recommended. **$1,950 > Trinity International > ticomputers.com.au**	**Enspire Lightspeed X58** While TI's AMD-based PC is a definitive example of great performance for a $2,000 PC, Enspire's Lightspeed provides almost a definitive version of a $4,000 PC. **$3,722 > Enspire Digital > enspiredigital.com.au**
HTPC	**Dell Studio One 19** Hyper-stylish touch-screen PC from Dell; part of a trend of integrated machines designed for domestic areas and Windows 7. To be released next month. **$TBA > Dell > dell.com.au**	**HP Touchsmart IQ500** This is the closest the PC world has to the iMac, with a touchscreen that reminds you of the iPod touch. Great, no-fuss home theatre PC. **HP > $2,499 > hp.com.au**	**HP Touchsmart IQ800** HP has really nailed the concept with the IQ machines. The IQ800 is the closest thing to a merger of the PC and TV. Full HD screen, TV tuner, Blu-ray player. **HP > $3,799 > hp.com.au**
TINY PC	**Dell Studio Hybrid** PCs are clearly tired of being branded boring. But like Apple, Dell expects a premium for these designer pill-shaped low-power PCs. **$2,135 > Dell > www.dell.com.au**	**DreamVision Atom Mini PC** One of the first based on Intel's Atom dual-core CPU. Add a 2.5in hard drive and you have a mighty mite PC. **$399 > Pioneer > Pioneercomputers.com.au**	**ASUS Eee Box B202** ASUS has taken its enormously successful Eee PC concept and applied it to a desktop. Atom-powered, 1GB of RAM and 80GB drive. **$429 > ASUS > www.asus.com.au**

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
EXTERNAL HARD DRIVE	**WD My Book World Edition** WD is trying to make NAS more user-friendly with this new home 1TB NAS which provides Gigabit Ethernet, Wi-Fi connections and DLNA and UPnP streaming. **$350 > Western Digital > www.wdc.com**	**W D My Passport Elite** A 500GB portable drive that's fast, looks great and fits in your pocket – and best of all can be picked up for around $200 on the street. **$200 > Western Digital > www.wdc.com**	**Seagate FreeAgent Xtreme** Doesn't have RAID mirroring but still gives you 1TB of storage and Firewire, eSATA and USB 2.0. Plug it in and it's ready to go. Great price. **$199 > Seagate > www.seagate.com**
USB KEYS	**Kingston Data Traveler Blackbox** Kingston again! They set the standard in USB key drives. This one comes with software that encrypts its contents to FIPS 140-2 Level 2 standard. **$140 > Kingston > www.kingston.com**	**Kingston Data Traveler 150 32GB** A 32GB USB key that's virtually a portable hard drive — stick hours and hours of video in your pocket. Incredible. Supports Windows & Mac. **$140 > Kingston > www.kingston.com**	**Kingston Data Traveler 150 64GB** Kingston's 64GB drive takes all that's good with the 32GB drive and doubles it. Stick a bootable USB Linux, apps and masses of data on it like a tiny PC. **$200 > Kingston > www.kingston.com**
NETBOOK	**ASUS Eee PC S101** One of the first netbooks to transcend utilitarian, the metallic mocha chassis makes it look a million dollars and highlights the evolution of the Eee PC species. **$999 > ASUS > www.asus.com.au**	**Kogan Agora Netbook** Base version is almost component for component an MSI Wind; we recommend the Pro: larger (160GB) hard disk, more RAM and 6-cell battery (and is still cheaper). **$549 > Kogan > kogan.com.au**	**MSI Wind U120H** Same specs as the U100 but delivers on the ideal of the go-anywhere, permanently-connected device by including in-built 3G HSDPA. **$999 > MSI > www.global.msi.com.tw**
NOTEBOOK ALLROUNDER	**Dell Adamo** Milled from a single razor-thin piece of aluminium, this is Dell's 16.5mm thick take on the MacBook Air fashion accessory. **$3,699 > Dell > Dell.com.au**	**Toshiba Satellite A300/0C3** The Satellites are Toshiba's cost-effective all-rounders. The base model 0C3 starts with 2GB of RAM, 320GB HDD, 15in display, four USB ports and HDMI. **$1,499 > Toshiba > Toshiba.com.au**	**Toshiba Satellite U400** Not terribly expensive, but one of the best balanced notebooks across performance, features and portability, not to mention price. **$2,299 > Toshiba > Toshiba.com.au**
DESKTOP REPLACEMENT	**ThinkPad W700ds** Expensive, large and heavy, but the dual-screen capability, integrated graphic tablet and desktop-like specs mean it's a portable workstation.  **$7,500 > Lenovo > lenovo.com.au**	**Acer Aspire Gemstone Blue 8920G** Incredible 18.4in, 1,920 x 1,080 HD display. There's a Blu-ray drive and 5.1 surround sound. This Core 2 Duo T8300 machine is a 4.1kg head-turning beast. **$2,699 > Acer > www.acer.com.au**	**HP X18** Top-of-the-line portable media centre. With an 18.4in, 1,920 x 1,080 screen, a Blu-ray player, a DVB-T/Analogue TV-tuner and great speakers. **$3,899 > HP > www.hp.com.au**
BUSINESS NOTEBOOK	**Sony VAIO VGN-P** NEW A truly tiny $2,299 notebook for business people and fashionistas who would not be seen dead with a cheap netbook. **$2,299 > Sony > Sony.com.au**	**Lenovo's ThinkPad X301** NEW Lenovo's X ThinkPads look the part. The X301 is the latest in the line, with a 13.3in backlit widescreen display, 2GB RAM and 120GB HDD. **$2,924 > Lenovo > Lenovo.com.au**	**Toshiba Portege R600** NEW Full-power business notebook in a netbook shell. Sub-1kg, yet with a 1.4GHz Core 2 Duo, 3GB of RAM, DVD burner and 200GB HDD/128GB SSD!  **$3,300 > Toshiba > Toshiba.com.au**

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
SMARTPHONE	**Samsung INNOV8** The INNOV08 has more features than any other smartphone on the market, from all the HSDP and Wi-Fi, connectivity to an eight-megapixel camera and 16GB flash drive. $899 > Samsung > Samsung.com.au	**iPhone 3G** Try as we might to find a worthwhile alternative, the iPhone is the best all-rounder smartphone — glorious UI, 3G speed, more apps, and still great pose value. Plan > Apple > www.apple.com.au	**BlackBerry Bold** The Bold is the most addictive BlackBerry yet, with built-in Wi-Fi and GPS, a stunning screen and DivX/XviD playback. It's still the best for email too. Plan > RIM > www.blackberry.com
MUSIC PLAYER	**iPod Shuffle** The 3rd-generation shuffle moves the playback controls into the earphones and has voice-over that tells you what song is playing. 4GB of storage carries up to 1,000 songs. $129 > Apple > apple.com.au	**Apple iPod nano** A new long narrow design and with an accelerometer that kicks the nano into landscape mode when you hold it sideways. Now in 8GB and 16GB models.  $199 > Apple > www.apple.com.au	**Apple iPod Classic 80GB** The number-one selling MP3 player of all time — with the most intuitive menu system and super iTunes software that combines downloads and music management. $319 > Apple > www.apple.com.au
MP3 HEADPHONES	**Sony MDRAS20J Active** NEW If you spend a lot of time in the gym, slide these on and you'll never worry about them coming off. Sound is so-so, but it's all about worry-free workouts. $20 > Sony > sony.com.au	**Apple In-Ear w/rem. & mic.** NEW From Apple, you'll be amazed how much better these are than the standard issue headphones you get with an iPod. Each earpiece contains a woofer and a tweeter. $109 > Apple > store.apple.com	**Shure SE420-K Earphones** NEW If you want to experience truly amazing sound in your ear canal, these are the bomb. All the tricks for professional-style sound reproduction are in there. $579.95 > Shure > shure.com
MP3 DOCKS	**Altec Lansing octiv AIR** NEW Unlike most other iPod docks, the dock and speaker connect to each other wirelessly up to 30m away. Produces a warm, well-balanced sound. Altec Lansing > alteclansing.com > $799	**TDK NX-04CD remote & Mic** NEW Audio performance blows similarly priced docks out of the water, and looks great. But it can also play music off USB drives and SD cards. $300 > TDK > tdk-media.com	**B & W Zeppelin** NEW Simply the best-quality iPod dock speaker system around, even if not the most expensive. So good you need 320Kbit/s tracks to get the most out of it. $1,300 > Bower-Wilkins > bower-wilkins.com
IN-CAR DOCKS	**Alpine eX-10** NEW A great option for plugging an iPod into your original car stereo. Plug the eX-10 into the auxiliary port or sync it with the FM transmitter. $299 > Alpine > alpine.com.au	**Clarion CZ209A** NEW An affordable in-car single DIN head unit with all the basics, such as direct iPod control (via USB port), plus convenient front panel auxiliary input. $279 > Clarion > clarion.com	**Alpine VA-W502E** NEW The iVA-W502E is Alpine's most advanced mobile media station and plays back all media formats. Plus, it's got a 7in high-resolution WVGA display. $1,899 > Alpine > alpine.com.au
GPS	**Uniden TRAX 430 GPS** Comms company Uniden has released a ripper of a GPS device, impressing with its ease-of-use, exceptional screen and ability to create 3D maps. $379 > Uniden > www.uniden.com.au	**TomTom ONE XL** The most affordable TomTom that delivers the features that matter, with the same display and navigation engine of the more expensive TomToms. $399 > TomTom > www.tomtom.com	**TomTom GO 930** The top-of-the-line TomTom delivers traffic messaging, intelligent live routing, FM transmitter, voice-recognition and text-to-speech. $849 > TomTom > www.tomtom.com.au

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
COMPACT CAMERAS	**Panasonic Lumix DMC-G1** A compact camera that looks and acts like a DSLR, with an interchangeable lens facility, but is as easy to use as a point-and-shoot. **$1,649 > Panasonic > www.panasonic.com.au**	**Nikon Coolpix S550** Good, cheap and easy to use with all the useful features of its more expensive competitors.  **$250 > Nikon > www.nikon.com.au**	**Canon IXUS 80 IS** Probably the best digital compact on the market, with every function you could ever need but still at a great price. **$379 > Canon > www.canon.com.au**
DSLR CAMERAS	**Canon EOS 50D** Although better than the 450D, the 50D's price stops it being in the Best Value category. Still not as good as the Nikon D90 but still a great camera by any means. **$2,599 > Canon > www.canon.com.au**	**Canon EOS 450D** The best low-price DSLR you can get. Suited to the amateur photographer, the 450D offers heaps of features in a tiny DSLR frame. Bargain! **$949 > Canon > www.canon.com.au**	**Nikon D90** This is just sexy! The first DSLR with HD video, the D90 is the best non-professional camera you could get without sending yourself broke. **$1,699 > Nikon > www.nikon.com.au**
HD CAMCORDER	**Kogan DVC camcorder** While it's not in the Canon Full HD class, it's the only camcorder that delivers Full HD for anywhere near the price. Records in Mov format only. **$369 > Kogan > www.kogan.com.au**	**Canon HF11** An SD-card based camcorder with few moving parts, long battery life, and low weight. It records in AVCHD format, is easy to use and has excellent optics. **$1,699 > Canon > www.canon.com.au**	**Sony HDR-FX1000** The ultimate camcorder. Basically a pro camera without some broadcast features, it records full HD on HDV (Mini) tape delivering unparalled quality. **$5,999 > Sony > www.sony.com.au**
PHOTO FRAMES	**Kodak EASYSHARE W1020** A great 10in display, it comes with Wi-Fi access to connect you to Kodak FrameChannel's news, weather, sports and can receive pictures from Flickr or Kodak's online gallery. **$285 > Kodak > www.kodak.com**	**Kodak P720 Touch Digital** Kodak's entry-level Photo Frame, with a good quality 7in screen and the excellent Quick Touch Border which makes it really easy to navigate menus. **$140 > Kodak > www.kodak.com**	**Sony DPF-V900** The frame with the most stylish design and best picture quality and viewing angles that we've seen. Has several display modes and connection interfaces. **$349 > Sony > www.sony.com.au**
HDTV	**Kogan HD 32 1080P** A 32in 1080p HDTV with HD tuner selling for $899 whose quality is as good as anything in that size. HDTV doesn't get any better than 1080p. **$749 > Kogan > www.kogan.com.au**	**Sony Bravia W-series** One of the best LCD HDTVs: delivers great blacks, superb colour fidelity and great upscaling. **$2,699 > Sony > www.sony.com.au**	**Sony XBR series** A plasma killer — an LCD HDTV that cleverly uses LED backlighting in three different colours (RGB), to create the deepest blacks and strongest colours yet on an LCD. **$6,399 > Sony > www.sony.com.au**
TV TUNER	**Silicon Dust HD Home Run** A networked TV tuner server that allows any PC on your network to access digital television. Cheaper and easier than multiple antenna points. **$299 > Lako Pacific > hdhomerun.com.au**	**Kworld DVB-T 395UR** A basic HD tuner card that allows you to watch HD digital TV on your PC or notebook. It's not flash, but it works well, is portable and convenient. **$79 > Kworld > www.kworld.com.tw**	**Hauppauge WinTV PVR-350** With a 125-channel capable receiver, this PCI card pauses and replays shows, is able to schedule recordings and burn them to CD or DVD. Great quality.  **$429 > Hauppage > www.hauppage.com**

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
DISC PLAYERS	**Sony PlayStation 3 80GB** Yes, it's a games console, but it also doubles as a Blu-ray player that's as good as any standalone devices on the market. It's the same price as some of the better ones, so do your sums. **$699 > Sony > www.sony.com.au**	**Kogan Blu-ray Player** Basic, affordable. Plays back good-quality HD and upscales DVDs. Downside is lack of support for BD-Live (Profile 2.0) which means no internet content or firmware upgrades. But at $249 who's complaining? **$249 > Kogan > www.kogan.com.au**	**Sony BDPS350** Superb HD playback quality and does great upscaling of DVDs to high definition. Unlike last month's $1,799 Pioneer, available for around $400 on the street. **$400 > Sony > Sony.com.au**
DVR	**FOXTEL iQ2** NEW If you watch pay TV, the FOXTEL iQ2 is a must. Records both standard and high-definition free-to-air TV to a spacious 320GB hard drive. **$10 month > FOXTEL > www.foxtel.com.au**	**TiVo HD** NEW The TiVo's smart recording features (such as WishList) are the main reason you'd choose this DVR over the others, despite the fact that it won't record pay TV. **$699 > TiVo > www.tivo.com.au**	**Panasonic DMR-BW500** NEW The ultimate high-definition DVR — can record two HD programs simultaneously to its 500GB hard disk or directly to Blu-ray media. A bucketload of connectors too. **$2,199 > Panasonic > Panasonic.com.au**
ROUTER	**D-Link DGL-4500** A dual-band gigabit router built for gamers. Helps prioritise game traffic, and now with Green technology, which detects link status and cable length and adjusts power usage accordingly **$350 > D-Link > www.dlink.com.au**	**TP-Link TL WR941ND Wireless N** A Draft 2.0 N router with MIMO, using three adjustable antennas for speeds of up to 200Mbit/s. Performance is decent and the documentation is good. **$129 > TP-Link > www.anyware.com.au**	**Linksys Dual-N WRT610N** It does dual-band Wireless N (5GHz and 2.4GHz), is one of the best performers in testing and looks great. Comes with Linksys' superb LELA network setup wizard. **$290 > Linksys > linksys.com.au**
PRINTER HOME	**Canon Selphy ES2** A dye sublimation printer, the Selphy can print directly from every variation of memory card and even from mobile phones, and you don't need a computer. **$299 > Canon > www.canon.com.au**	**HP Color LaserJet CP1215** NEW It's not the fastest colour laser out there, but it has two things going for it: the HP LaserJet heritage and its price, which is well-affordable home use. **$299 > HP > hp.com.au**	**Samsung CLP-350N laser** NEW The first in the Samsung lineup of excellent affordable colour lasers, with all the specs to meet basic business requirements. **$399 > Samsung > Samsung.com.au**
PRINTER — SMB	**OKI B430dn** NEW If you're looking for a solid workhorse mono laser, OKI's B430dn is perfect for the task, and should keep many small businesses happy. **$874.50 > Oki > www.oki.com.au**	**Dell 2130cn Colour Network** NEW Dell is becoming synonymous with value in business printers. Its 2130cn is a good entry-level, biz-grade colour laser, with a duty cycle of 40,000 pages/mth. **$499 > Dell > dell.com.au**	**HP Color LaserJet** NEW On the expensive side, but the CP3525x provides Gigabit Ethernet in addition to USB 2.0. Great if you feel the need for speed and can put up with some noise. **$2,403 > HP > www.hp.com.au**
MFC	**Canon MX860** NEW Canon's MX860 is a full-function inkjet MFC aimed at the lower end of the SME market, with USB 2.0, 802.11b/g and 10/100 Ethernet. **$299 > Canon > www.canon.com.au**	**Epson Stylus Photo TX800FW** This stylish MFC will look great in a home office — but it also produces good photos and good copying results. Can also be shared across a network. **$399 > Epson > www.epson.com.au**	**Brother MFC-6490CW** NEW If your business needs an A3 printer, the Brother MFC-6490CW is a good choice. Includes both Wi-Fi and Ethernet interfaces. **$549 > Brother > www.brother.com.au**

www.apcmag.com

SERVER HARDWARE MASTERCLASS

APC's complete guide to server hardware.

With the boom in virtualisation, an understanding of server hardware is critical for any technical professional and, increasingly, for desktop users who are installing home servers.

Yet, unless you work directly with servers, there is little out there that starts at the very beginning and explains the fundamentals of servers.

At *APC* we think servers are sexy. So we are launching the Server Masterclass on our web site for technical professionals. Follow the course by server expert Jarrod Spiga and, by the end of it, you should know servers as well as you know a PC.

THE SERVER MASTERCLASS LOOKS AT THE FOLLOWING:

- **SERVER COMPONENTS AND HOW THEY DIFFER FROM PC COMPONENTS**
- **BLADE SERVERS**
- **STORAGE – DAS, NAS AND SAN**
- **NETWORKING AND CLUSTERING**
- **SCOPING A SERVER – DETERMINING THE RIGHT SERVER**
- **DETERMINING THE RIGHT COMPONENTS FOR THE SERVER**
- **YOUR SERVER'S HOME**
- **MANAGING THE SERVER**
- **AND MUCH MORE!**

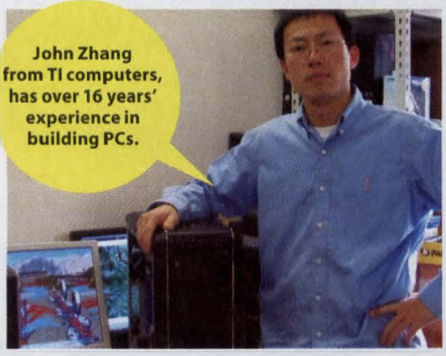
72 masterbuilder

HOW TO BUILD THE ULTIMATE PC

One of the joys of computing is building your own PC. Each month a Master Builder will configure a PC for a specific task and pricepoint, recommending the best components for the job. But we also want to know what you, our readers are building, so Owner Builder is your showcase.

Best Gaming PC under $2,000

PC builder **John Zhang** suggests the best components for affordable gaming.



JOHN ZHANG'S BARGAIN GAMER PC

WHAT JOHN RECOMMENDS FOR A SUB-$2,000 GAME PC AT A GLANCE

Component	Brand	Price
CPU	Intel Core 2 Duo E8500 CPU	$290
CPU cooler	Standard fan	N/A
Motherboard	GA EP45UD3R	$210
RAM	Kingston 4G DDR II PC6400 800MHz	$85
Graphics	Palit Geforce GTX 285 1GB	$520
Audio	Onboard	N/A
Hard drive	2 x 750GB Samsung SATA II HDD 7,200rpm	$240
Optical drive	LG or ASUS 22x Speed Dual Layer DVD RW SATA	$50
PSU/Case	iCute Case with 550W Power	$160
Monitor	22in LG 2252TQ LCD Monitor 2ms DVI 10,000:1	$250
Keyboard & mouse	Logitech Ps II Keyboard and Mouse Optical	$20
OS	Windows Vista Home Premium SP1	$175
		$2,000

John Zhang is our inaugural Master Builder. His company, TI Computers, is a system builder specialising in high-end gaming systems, business systems, workstations and server systems. It has been around for over 16 years and its systems are regular winners of *APC*'s Editor's Choice and Highly Recommended awards.

CPU

Intel E8500 CPU

Intel's E8500 3.16GHz Core 2 Duo CPU has a fast clock speed, 6MB of cache, and plenty of room for overclocking, making it great value for a gaming PC. Intel's Core i7 is better but costs around an extra $400, which would push our PC over $2,000.

CPU COOLER

Standard fan or Cooler Master V8

The standard fan that comes with the CPU works fine, but if you want to overclock then I recommend the Cooler Master V8. Its eight heat pipes and centre-mounted 120mm fan generate enough horsepower to cool any high-performance CPU, but it costs $99.

MOTHERBOARD

Gigabyte GA EP45UD3R

Gigabyte Ultra Durable 3 series motherboards deliver dramatically lower system temperature and enhanced stability for overclocking, plus the one-click Easy Energy Saver button instantly takes advantage of power savings. Great for gaming PCs and business PCs.

RAM

Kingston DDR II PC6400 800MHz

It's great-value, very reliable memory. But, if you want to overclock then you better stick with G.Skill performance RAM with heatsink and a voltage range of 1.8v ~ 2.0v.

GRAPHICS CARD

Palit Geforce GTX 285 1GB

Excellent value, great performance, and NVIDIA cards run a lot cooler then their ATI counterparts. If you can spend a bit more, the 1792M Geforce GTX 295 dual-GPU video card is the best one available but will cost you an extra $245.

AUDIO

Onboard

The onboard audio is sufficient, it includes eight-channel audio for PC speakers and SPDIF optical output for hi-fi systems.

HARD DRIVE(S)

750GB HDD Samsung SATA II x 2

The motherboard has RAID on board, so with dual HDD setups you can run RAID 0 for maximum performance (game customer) or RAID 1 for mirror (business customer).

OPTICAL DRIVE

22 x Speed Dual Layer DVD RW LG

The LG standard DVD RW Dual Layer optical drive is very cheap but does the job. A Blu-ray burner is the next step up but costs around $200 extra.

PSU

550W Power in iCute case

See case.

CASE

iCute midtower

At TI Computers we use the iCute midtower case with nine drive bays with a huge 220mm large side. If you can spend a bit more then the Cooler Master M690 is the best choice, great performance and style, with front USB, FireWire, eSATA ports all built on top of the case.

MONITOR

LG 2252TQ

The 22in LG 2252TQ LCD Monitor is stylish, crisp and clear, 2ms refresh speed, 10,000:1 ratio, DVI cable all included.

KEYBOARD & MOUSE

Logitech Ps II Keyboard/Mouse

Optical Wheel Mouse; cheap-but adequate. You can also upgrade to wireless for an extra $30 or to the top-of-the-range bluetooth Logitech MX 5500 for $160. [Ed: John's rec. of Logitech is independent of our monthly prize on the next page].

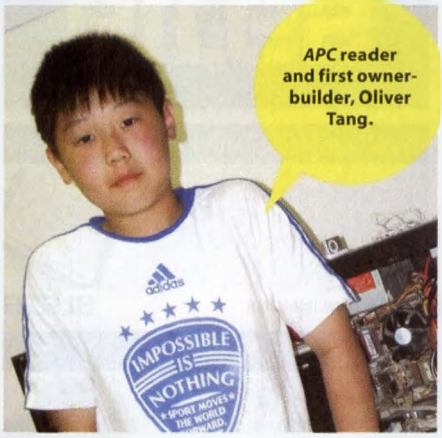
APC MAGAZINE OWNER BUILDER READER PC

masterbuilder@acpmagazines.com.au

Submit your PC configuration to APC's Master Builder and, if chosen to appear in the mag, you will win a Logitech MX1100 Cordless Laser Mouse worth $179.95, and the Professional Master builder will also give you some advice on your machine. The MX1100 fits naturally in your hand for maximum comfort. The MX1100 also lets you fly through long documents and web pages with one spin. Send your PC configuration to masterbuilder@acpmagazines.com.au.

Oliver Tang's bang-for-buck PC

Our first owner-builder builds an affordable starter PC.



13-year-old Oliver Tang, from Endeavour Hills, Victoria, built himself a machine that was affordable, could play games, and mostly, gave him bang for his buck. Here he shares and explains component selection.

CPU

Intel Core 2 Duo E4600

This was the one that stood out for me because of its price and its speed. It was a budget model that wasn't too slow. It was LGA775 compatible and could run all of my games and programs. I had overclocking in mind, and this CPU could take it.

RAM

4GB Apacer 800MHZ

Initially I had Vista Home Premium so the 4GB was used to its full capacity but because of all Vista's security issues, I downgraded back to XP, even though I can only use 3.5GB.

MOTHERBOARD

ASUS P5KPL-CM

I didn't think that a motherboard mattered too much for performance and as I was on a tight budget I went for a motherboard in the budget end of ASUS's P5 line.

GRAPHICS

ATI HD 4550

I originally had a 3450, but that kept on lagging my display like hell and it always tore at the edges of my screen when it was under pressure. So I got a 4550 for my 13th birthday.

AUDIO

On-board HD 6 channel audio

I didn't want an additional sound card. I'm OK with not having the best quality of sound. All I need was to be able to hear the drums in the background of my music and that was clear enough.

HDD

IBM DARKSTAR 250GB

I didn't want anything below 200GB. So I got an HDD that wasn't dodgy like my old computer's 80GB Samsung HDD. It's 7,200RPM. I just wanted to be able to hold ALL my stuff.

PSU

Generic 450-watt PSU

My PSU came with the chassis so I didn't want to buy another. Anyway, 450-watt seemed like enough; it could run all my parts no problem-o. I didn't want to increase my carbon footprint either.

CASE

Random SuperPower Chassis

This looked good, had everything I needed. It wasn't a huge, full tower, yet it could contain the beast!

MONITOR

Viewsonic VA2026w 20in

This monitor is awesome. Much bigger than I need but hey... I LOVE IT!!!!! 20in is huge, but I'm getting used to it!

THE FUTURE

My next upgrade will be the CPU. I would like a CPU that has top-end performance, definitely a quad-core! That would be awesome. I like my PC because I built it, it's totally mine and nobody else can use it. It's customised for my comfort and style, and yeah, my PC reflects who I am and my personality.

PROFESSIONAL OPINION

PRO BUILDER JOHN ZHANG COMMENTS ON OLIVER'S PC.

Try upgrading to an Intel E5300 CPU, which could be the most overclockable low-end CPU in the market and costs around $130. The ASUS motherboard is fine for entry-level PCs, but if you don't use the onboard video then I recommend you change to the Gigabyte GA EP31-DS3L motherboard. There's around $20 difference but it is a full-size motherboard and much easier to overclock. The ATI 4550 is a mid-range video card: it will work fine for most games; the ATI 4850 will be much better but it costs around $200. Hard disks are very cheap these days: the best value for money are 500GB Seagate or Samsung HDDs, priced around $99. You won't save much by buying 320GB or 250GB drives.

Best build

APC experts recommend the best components to build the best budget, mid-range and ultimate PCs that money can buy.

APC MAGAZINE MASTER BUILDER APC LABS

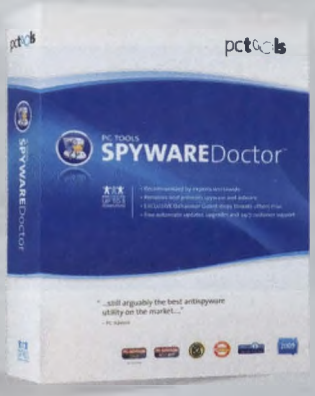
LOOK OUT FOR THESE

NEW

Products marked with this stamp are the latest additions or updates in Best Build.

	BUDGET $1,249	MID-RANGE $3,114	THE ULTIMATE $9,119
CPU	Intel Pentium E5200 2.5 GHz Ultra cheap entry-level CPU which can be overclocked to perform like a more expensive CPU, such as an E7300. Intel > www.intel.com $100	Intel Core i7 920 The baby of the new Core i7 family blows away its Intel predecessors in anything requiring multi-processing. Needs X58 chipset motherboard. Intel > www.intel.com $475	Intel Core i7 965 Extreme Edition Simply put, this is the fastest desktop quad core CPU available today. You will not find better. Intel > www.intel.com $1,675
COOLER	Cooler Master Hyper Cooler Master TX2 Don't let the price tag scare you off: this offers many of the features we see in higher-end coolers: a copper base, alum. fins and 3 heat-pipes. Cooler Master > www.coolermaster.com $49	Thermolab BARAM The Thermolab Baram heat sink uses a combination of pure copper, aluminium and positioning to provide maxiumum heat extraction. Thermolab > www.thermolab.com $70	Cooler Master V10 Two fans, three sets of cooling fins and ten heat pipes that will cool anything. The ultimate thermal solution. Cooler Master > www.coolermaster.com $208
MOBO	Gigabyte GA-EP45-DS3L Great budget board. Has good performance, can handle overclocking and comes with a great price. Gigabyte > www.gigabyte.com.au $170	Gigabyte GA-EX58-DS4 Want to get into Core i7 computing on a budget (relatively speaking)? This is cheapest X58 board for Intel's new CPUs. Gigabyte > www.gigabyte.com.au $360	ASUS P6T Deluxe/OC Palm Overclocking features for the Core i7 extreme. Includes an external PDA-like device for monitoring and overclocking. ASUS > www.asus.com.au $599
RAM	Team Extreem Dark PC2-6400 4-4-4 4GB An aggressively-priced low latency DDR2 kit that packs a whopping 4GB across two sticks, more than enough for most gamers. Team Group > www.teamgroup.com.tw $130	Corsair TR3X3G1333C9 3GB (1333MHz) Corsair DDR3 memory is reliable and stable, using XMS technology heat spreaders to keep the memory chips cool. Corsair > www.corsair.com $165	Corsair Dominator TR3X6G2000C8GTF This is the biggest overclocking RAM on the market. Push the clocks up to 2,000MHz and at 8-8-8-24 timings. Corsair > www.corsair.com $679
GRAPHICS	HIS ATI 850 512MB The Hightech ATi 4850 512MB is a competitively priced all-rounder with enough power for gaming and HDMI support for 1080p. Hightech > www.hisdigital.com $230	ATI Radeon HD4870 GDR5 Offers good value and performance. Runs CrossFire, so you can always add a second card for incredible graphics performance. AMD > www.amd.com $490	Manli GeForce GTX295 1792MB A classic Thermaltake box with plenty of glowing colours and an alien gaming look, plus huge airflow and easy setup. Very affordable. Manli > www.manli.com $795

	BUDGET	MID-RANGE	THE ULTIMATE
HDD	**Seagate Barracuda 500 GB 32MB** It's astonishing to realise that a good quality 500GB drive can be had for less than $100. The best budget option. Seagate > www.seagate.com $90	**Western Digital Caviar Black 1TB** A 1TB drive was considered a premium HDD a couple of months ago, now it's the minimum for a reasonable PC. Western Digital > www.westerndigital.com $200	**Western Digital Green Caviar 2TB** Need more storage? Try the world's first 2TB hard drive from WD. This 3.5in drive has four 500GB platters and a 32MB cache. Western Digital > www.westerndigital.com $469
HDD 2	**None needed** (At this price level, one drive will do.) N/A	**Western Digital VelociRaptor** Fastest mechanical drive, with 300GB. Should be the primary drive for OS and apps while a fat slower drive holds the data. Western Digital > www.westerndigital.com $280	**Intel X25-E 64GB SSD** Use this SSD for pure speed on your boot disk. You'll be amazed at the difference. If you can afford it, it's like a major RAM/CPU upgrade. Intel > www.intel.com $1,500
OPTICAL	**LG 22x Dual Layer DVD RW SATA** Doesn't burn to Blu-ray but cheap and does the job. If you're looking for the best budget optical unit, this is it. LG > www.lg.com.au $40	**LG Blu-ray/HD-DVD Combo Drive** Plays both Blu-ray and remaining HD-DVD discs, and also comes with PowerDVD 7. Can be upgraded to support 6-channel audio. LG > www.lg.com.au $170	**Sony BWU3200S Blu-ray burner** Writes to BD-R at 4x and BD-RE at 2x, plus does all the usual DVD reading, writing and arithmetic. Nice one. Sony > www.sony.com.au $490
PSU	**Antec Basiq BP500U** From Antec's budget range of power supply units but is a solid workhorse performer which does the job. Antec > www.antec.com $90	**Antec TP-550** The Antec True Power 550W PSU is highly efficient, stable and reliable. With three +12V rails it allows power to be distributed more evenly. Antec > www.antec.com $150	**Gigabyte ODIN Pro 1200W Modular** Modular cabling, 4-rail design, Japanese capacitors and runs silent. Plenty of juice for a top-end system. Gigabyte > www.gigabyte.com $375
CASE	**Thermaltake Case Wing RS101** A good, cheap but effective mid-tower case with a 120mm fan, extra ventilation for CPU and tool-free assembly. Nice piano-black finish! Thermaltake > www.thermaltake.com.au $80	**Antec Nine Hundred Two** Antec has updated its classic Nine Hundred gamer's case, improving the cooling and adding better cable management and an inside paint job. Antec > www.antec.com.au $220	**Cooler Master ATCS 840** Nothing says style like understatement. Top-quality design and manufacture, plus heaps of room and cooling. Cooler Master > www.coolermaster.com $400
MONITOR	**BenQ E2200HD** A 21.5in Full HD Widescreen LCD monitor offering 5ms Response Time, 1,920 x 1,080 resolution, Dynamic Contrast Ratio of 10,000:1. BenQ > www.benq.com.au $250	**Dell 2209WAf** With a top-quality panel, clean design, built-in hub and adjustable stand, this monitor should last through a few upgrades. Dell > www.dell.com.au $419	**Dell 22in Crystal** Maybe not the fastest or the biggest monitor around, but take a look at it! Stylish as they come. Dell > www.dell.com.au $1,599
KEYBOARD	**Logitech Ps II Keyboard and Mouse** An affordable but effective combo. Combining packages of keyboard and mouse is the best way to stick to a budget. Logitech > www.logitech.com.au $20	**Microsoft Natural Keyboard 4000** Excellent ergonomic board with loads of hot keys. Great for hand comfort and heaps of value-added special functions. Microsoft > www.microsoft.com.au $50	**Logitech G19** Is it still a keyboard if it comes with its own mini monitor? Probably has more computing power than your first PC. Logitech > www.logitech.com.au $245
MOUSE	**Logitech Ps II Keyboard and Mouse** Combinations of keyboard and mouse are the best options when trying to keep your peripheral costs down. (See above.) Logitech > www.logitech.com.au N/A	**Microsoft Wireless Laser Mouse 600** Superb ergonomic and affordable laser mouse with Windows flip 3D key and four-way scrolling. Microsoft > www.microsoft.com.au $45	**Cyber Snipa Stinger Laser Mouse** We've come to love this mouse, despite (or because of) its good performance and reasonable price. Cyber Snipa > www.cybersnipa.com $85



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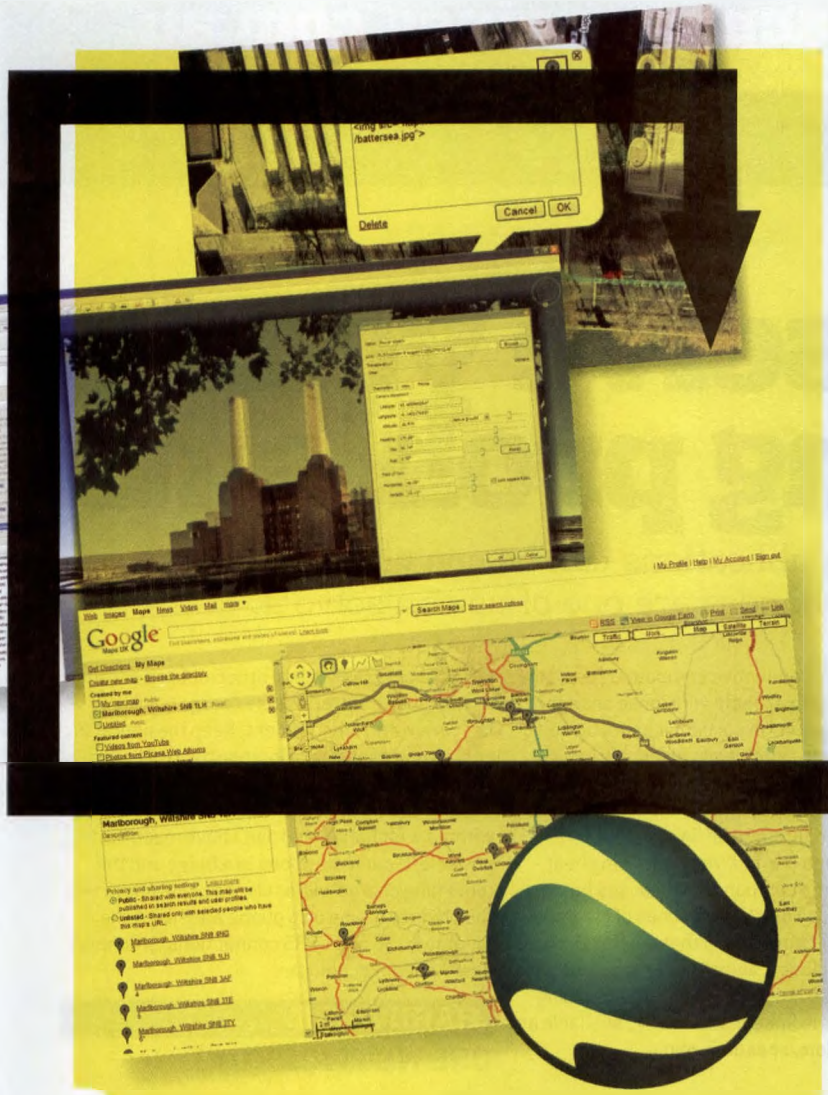
77 how to

PROJECTS, TIPS AND TRICKS



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HELP AND ADVICE

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In our new Quick Tips area, we'll answer technical questions and provide quick tips to help you get more from your computer. If you have a question that other readers may be able to solve, email it to *APC* at askapc@acpmagazines.com.au, or post it online on our forums at **apcmag.com/forums** for a quick reply. We'll publish the best answers and tips each month in the magazine.

Experts solve your computing problems

APC, its readers and our partner publications can be one giant helpdesk. If you have a technical problem, chances are one of us can solve it.

HARDWARE

OVERHEATING COMPUTER

Q Recently my computer has started to freeze up, generally when I'm playing a game. This forces me to shut the PC down and restart it. The last time this happened, I felt the top of the case and it was extremely hot, so I think that overheating has to be the cause of my problems. I have tried opening up the casing and leaving it open to the air, but it doesn't seem to help. Do you have any suggestions for how to cool the PC down?

Jack Henshaw

A The reason that opening up your computer isn't helping is that you have decreased rather than increased the airflow around important parts like the processor. But there are a few other things that you can do to try to reduce your computer's temperature. The first is to check your CPU heatsink fan. Is the fan working? If so, are the pushpins in the correct position and is the heatsink securely attached to the socket or motherboard? You should also check that the airflow isn't blocked by cables or poorly positioned hardware. Finally, if you see dust, make sure that you clean the fins on the heatsink. You could also check whether the thermal interface material on your CPU has become dried and flaky. If so, replace it with a fresh thermally conductive compound (you can get a tube of thermal paste with loose change). The fact that gaming in particular heats up your PC could indicate a problem with your graphics card, so check that it's properly seated and clear of dust. As for the case, put it back on so that air can be pulled in through the 'in' vents and expelled through the 'out' vents, drawing heat away from all the components it passes by. There should also be several inches of clearance all around your computer so that the hot air can escape. Don't place it anywhere near a radiator or anything else hot. A great tool for remedying hot computers is SpeedFan, which is available at **www.almico.com/speedfan.php**.

SMARTPHONES

MOBILE TIP

Q Not sure what I am doing wrong, but I find that my mobile phones tend to lose charge earlier than those of my colleagues. I have checked the usage patterns and mine isn't particularly intensive, nor do I always have Bluetooth or 3G on.

Zhang Lin

A You haven't told us where you keep the phone, and as strange as it may sound, that's important. If it's kept in a deep pocket where it's constantly warm it may be losing charge faster than other mobiles because mobile phone batteries lose charge quicker if kept in a warm environment. Keep the phone as cool as you can, ideally in a pouch attached to your belt rather than in a pocket. And here's another trick — if you're stuck somewhere without a recharger and don't have much battery power left, stick the phone in a fridge and the remaining charge will last longer. Apart from this, the obvious drains on a phone are things like, Bluetooth, 3G and GPRS connections. Shut them down whenever you can.

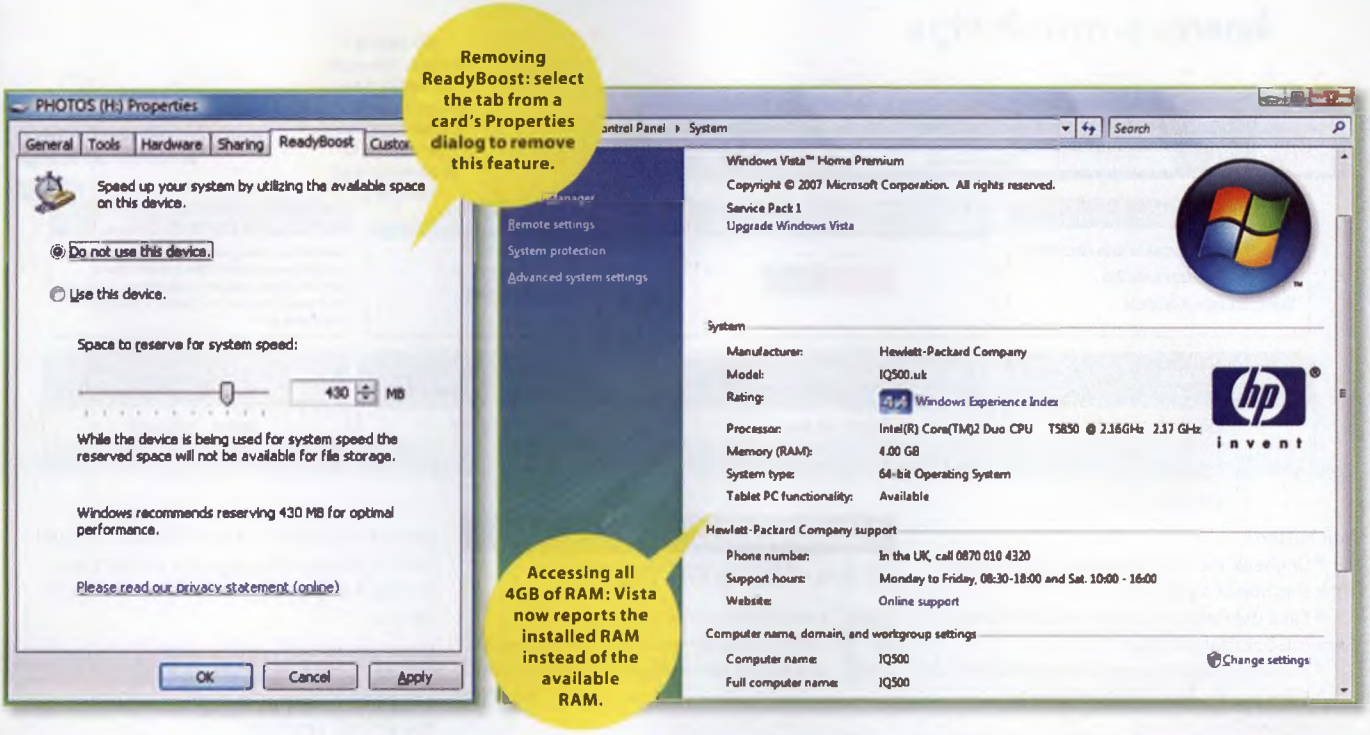
HARDWARE

USB NETWORKING

Q I frequently have to transfer raw video files between my PC and laptop and have already given up using my Wi-Fi connection in preference to an Ethernet lead. But these transfers still take an excruciatingly long time, even at 100Mbit/s, as each file is several gigabytes in size. Can you think of a clever way to speed up my life?

Peter Gough

A A USB 2.0 lead will give you a raw transfer speed of 480Mbit/s, almost five times faster than Ethernet. However, you have to be careful because you can't use a plain unbridged USB lead. In fact, if you use one of these (also referred to as an A/A


Removing ReadyBoost: select the tab from a card's Properties dialog to remove this feature.
PHOTOS (H:) Properties
General
Tools
Hardware
Sharing
ReadyBoost
Speed up your system by utilizing the available space on this device.
Do not use this device.
Use this device.
Space to reserve for system speed:
430
MB
While the device is being used for system speed the reserved space will not be available for file storage.
Windows recommends reserving 430 MB for optimal performance.
Please read our privacy statement (online)
OK
Cancel
Apply
Control Panel ▸ System
Search
Remote settings
System protection
Advanced system settings
Windows Vista™ Home Premium
Copyright © 2007 Microsoft Corporation. All rights reserved.
Service Pack 1
Upgrade Windows Vista
System
Manufacturer: Hewlett-Packard Company
Model: IQ500.uk
Rating: Windows Experience Index
Processor: Intel(R) Core(TM)2 Duo CPU T5850 @ 2.16GHz 2.17 GHz
Memory (RAM): 4.00 GB
System type: 64-bit Operating System
Tablet PC functionality: Available
Hewlett-Packard Company support
Phone number: In the UK, call 0870 010 4320
Support hours: Monday to Friday, 08:30-18:00 and Sat. 10:00 - 16:00
Website: Online support
Computer name, domain, and workgroup settings
Computer name: IQ500
Full computer name: IQ500
Change settings
Accessing all 4GB of RAM: Vista now reports the installed RAM instead of the available RAM.

USB cable), you could damage the USB ports of your computers or even their power supplies. Instead, you need a bridged (or A/B) lead, which are also known as USB networking cables. These leads have electronic circuits in the middle that enable the PCs at either end of the lead to communicate with each other.

Incidentally, this concept also works in reverse: a bridged USB lead will not work when trying to connect your PC with any peripherals. You can buy unbridged USB 2.0 leads cheaply in most computer shops. You'll instantly be able to spot them because of the bulge in the middle.

WINDOWS

REMOVING READYBOOST

Q I accidentally enabled the ReadyBoost option on my SD card when importing some photos from it, and now there's only room for 30 photos on my card. I would turn this feature off again but when I reinsert the card the ReadyBoost option is no longer there. Do you know how to turn it off?

Josh Butler

A To remove ReadyBoost from your SD card, reinsert it into the reader. Go to 'Start > Computer', then right-click on the card and select 'Properties'. From here you can open the ReadyBoost tab and change the card's settings to 'Do not use this device'.

WINDOWS

VISTA STEALS MY RAM

Q I have 4GB of RAM installed on my 32-bit computer, but the System Control Panel reports only 3,120MB. I've seen a tip that you can force 32-bit Windows Vista to access the full 4GB by using the command 'BCDEdit /set PAE forceenable'. I am loathe to try it in case I mess something up. What do you advise?

Nick Johnston

A The command you refer to takes into account that all chips since the Pentium Pro have 36-bit addressing and therefore can reference up to 64GB of RAM. However, they can only access this 4GB at a time. The /PAE switch forces a special mode (called Physical Address Extension) to allow the additional RAM to be switched in and out as required, and this is how Windows 2000+ Server Datacenter versions have always accessed 64GB on 32-bit processors.

The tip in question seems to have started making the rounds before the release of Vista Service Pack 1, when the operating system would report the amount of available RAM after allocating some for its own use. Typically a 4GB machine would report only 3.XXGB available, because Vista needs some RAM for its own purposes.

Using the command 'BCDEdit /set PAE forceenable' appears to solve the 'problem' by reporting the full amount of RAM in the System Control Panel. But all it does is force Vista to use memory-mapping routines it doesn't need, and so it runs more slowly.

Probably because of the hoo-ha about this, Service Pack 1 changed its policy to show the amount of physical RAM installed. So, whether or not you have a 32- or 64-bit computer, if you use 4GB of RAM you are only ever going to have 3.XXGB available to you. Unfortunately, this will be true regardless of what the System Control Panel seems to say.

HARDWARE

DELETING VISTA THUMBNAIL CACHE

Q Nothing infuriates me more than deleting images and then finding that thumbnails still show up when my other family members do a wildcard search for particular extensions, say, .jpg, on the computer. How do I disable the indexed thumbnails?

Tim Warren

A When Vista indexes drives, it creates thumbnails of the photos and keeps them in the thumbnail cache (\AppData\Local\Microsoft\Windows\Explorer). You're right, if you delete the real images, the thumbnails still remain in the index for all to see. Unlike in XP, which had a "Do not cache thumbnails" option, there is no easy way to prevent this in Vista, except to follow these excellent instructions, which were posted on an internet forum by someone called Voyager 62.

Log in as an administrator and firstly remove thumbnail creation. Open Windows Explorer, click the Organize button and select Folder and Search Options. Select the View tab and check the option 'Always show icons, Never Thumbnails', then click OK. Then empty the cache by running Disk Cleanup in 'Accessories > System Tools'.

Now, to prevent Vista storing the thumbnails to disk in future, navigate to the AppData\Local\Microsoft\Windows folder under your name.

- Right-click on Explorer folder and select Properties.
- Select the Security tab and click the Advanced button.
- On the Permissions tab, click the

Archiving the net: Although it doesn't have everything, www.archive.org has petabytes of backed-up web goodies.
INTERNET ARCHIVE
Web Moving Images Texts Audio Software Education Patron Info About IA
Forums FAQs Contributions Jobs Donate
Search:
All Media Types
Universal access to human knowledge
Anonymous User
Upload
Announcements (more)
Wayback Machine comes to life in new home
New Archive Data center with Sun
Yiddish literature goes online
Web
150 billion pages
WayBackMachine
http://
Take Me Back
Advanced Search
Welcome to the Archive
RSS
The Internet Archive, a 501(c)(3) non-profit, is building a digital library of Internet sites and other cultural artifacts in digital form. Like a paper library, we provide free access to researchers, historians, scholars, and the general public.
Moving Images
170,326 movies
Browse (by keyword)
Curator's Choice (more)
Live Music Archive
63,686 concerts
Browse (by band)
Audio
332,390 recordings
Browse (by keyword)
Texts
1,335,538 texts
Browse (by keyword)
Curator's Choice (more)

Edit button.

- Uncheck 'Include inheritable permissions from this object's parent'.
- Click the Remove button in the Windows Security box that pops up.
- Click the OK button on the Permissions Tab.
- Click the Yes button in the Windows Security box that pops up.
- Close all the open boxes.
- Go back into the Folder and Search Options and uncheck the 'Always show icons, never thumbnails' and you're done. Now Windows will create the thumbnails on the fly, but won't save them to disk.

HARDWARE

TAKE APPS WITH YOU

Q There's lots of tutorials on the internet for how to install Linux or even Win PE on a USB drive, but it's not the OS that I want to carry on my USB key, it's the applications. Is it possible to install my Windows applications to a USB key to run them on Windows computers?

Ray Magnini

A While you can't really run apps like Word or Excel off a USB key, there is a new standard called U3 that lets you do it with simpler apps such as browsers, email clients, open source office programs and other software that doesn't make intensive use of the Windows registry. A USB key with U3 enabled becomes a "U3 Smart Drive", is recognised by Windows and even comes with its own launchpad that looks a lot like the Windows start menu. A long list of U3-compatible programs is at **software.u3.com**. There is also a newly-released package called PackageFactory for U3, from **www.eure.ca**, which actually converts programs for use on a U3-enabled key. The makers, Eure, say: "PackageFactory for U3 works best for simple programs and applications with few support files (although you can add as many supporting DLLs and other EXEs as you need). PackageFactory fo U3 is free for non-commercial use."

HARDWARE

IS 64-BIT WORTH IT?

Q I am thinking of purchasing a new computer and wonder if it is really worth paying the extra to get a 64-bit machine?

Eric Pike

A A modern computer with a 32-bit operating system will work very well for most programs. For example, spreadsheets, web browsers and word processing programs will all probably run at about the same speed on either a 32-bit or a 64-bit computer. Indeed, if you're using basic office apps you'll be hard pushed to notice the difference between a 32-bit and 64-bit machine.

Move to 3D rendering or editing huge images in Adobe's Photoshop and it's a very different game. Here, huge amounts of data need to be moved around and processed, and this is where 64-bit computing comes into its own. Whereas a 32-bit operating system can only access 4GB of RAM, a 64-bit machine can access a theoretical 17.2 million terabytes of RAM. This is of course a purely theoretical limit. Indeed, if you're using different versions of Vista you'll find you have access to different memory limits.

There are other limiting factors too. Some motherboards can only access 8GB of RAM, and there's also a cost issue — just imagine how much a few trillion gigabytes of memory would cost!

But why does having more than 4GB of memory make editing big images faster? First, you'll be able to store bigger files in system memory and not need to keep moving data back and forth between RAM and your hard disk. Indeed, this is the main reason why many people have moved over to a 64-bit operating system.

There's also another advantage. In essence, with each processor cycle, a 64-bit CPU can theoretically process twice as much data as a 32-bit chip. This is of course only a theoretical benefit as it presupposes each processor cycle will be utilised to its maximum, and this isn't always the case.

So only consider moving up to a 64-bit OS if you're likely to be working on industrial-sized files. If you're pottering on the internet and writing in Word, a 32-bit version of Vista will be fine.

WINDOWS

UNDELETABLE VISTA ICON

Q There's a stubborn icon on my desktop that I can't delete. I've tried removing its associated program, but the thing still won't go. When I try to delete it directly, Windows Vista reports that the shortcut cannot be deleted as it cannot be found!

Isabella Cook

A This sometimes happens when Vista doesn't properly refresh your desktop after making a change. You can usually fix it by clicking on the desktop and pressing F5. Now try deleting the problematic icon — it should disappear.

INTERNET

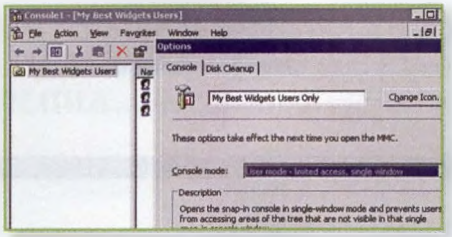
ARCHIVING THE NET

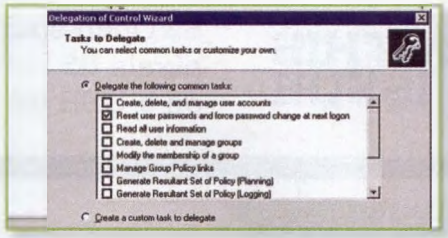
Q An IT guy laughed at me when I asked whether anyone was archiving the information on the net; a perfectly sensible question I thought, but surely someone *is* keeping track of the data that's been published on the net?

A There is no official backup for the entire internet like a company backs up all corporate data, but there is a long-running project called the Internet Archive (**www.archive.org**) that tries to archive as many web pages as possible. At the moment it has 4.5 petabytes (4.5 million gigabytes) of archived data such as web pages, videos, audio, texts and even music. Its Wayback Machine is an extraordinary 150 billion page web archive whose records go right back to the beginnings of the web, and where you can discover what your favourite web sites looked like in the past.

3 STEPS DELEGATE TASKS

Use Microsoft Management Console to delegate tasks to users or groups.


Console1 - [My Best Widgets Users]
File Action View Favorites Window Help
Options
Console Disk Cleanup
My Best Widgets Users Only
Change Icon...
These options take effect the next time you open the MMC.
Console mode:
Description


Delegation of Control Wizard
Tasks to Delegate
You can select common tasks or customize your own.
Delegate the following common tasks:
Create, delete, and manage user accounts
Reset user passwords and force password change at next logon
Read all user information
Create, delete and manage groups
Modify the membership of a group
Manage Group Policy links
Generate Resultant Set of Policy (Planning)
Generate Resultant Set of Policy (Logging)
Create a custom task to delegate

1 MANAGEMENT CONSOLE TOOL

Start by running the management console tool (mmc.exe). If you want to delegate permissions to ordinary users, you'll need to create a new view of just the User's Organisational Unit (OU). This is done by right-clicking over the User's OU and choosing 'New Window From Here' from the right-click menu. Close all the other windows that are open behind this one in the console.

2 SET CONDITIONS

From the File menu, choose Options. You can use these to set conditions for the console. Choose the most restrictive conditions when delegating tasks and don't allow changes to the console. Save your console and distribute it. The console will only work when installed on target machines with Active Directory (AD) tools installed. You can install AD tools using 'adminpak.msi'.

3 ASSIGN PERMISSIONS

From the Actions menu, choose 'Delegate Control'. This will enable you to delegate control of the target OU. Follow the Wizard through the process of choosing a delegate and assigning permissions. On this occasion I only want to assign a few tasks. When the user gets the MMC, they'll find they can access the users through AD, but all other tasks save for password resets are denied.

WINDOWS TIP

RUN AS ADMINISTRATOR

New programs are designed to run in a protected space within Windows Vista. The 'sudo' method of working is designed to prevent malware from invading your PC, which is obviously a very good thing.

The problem with this is that legacy programs don't always follow the new rules. They may, for instance, try and access the Registry or a protected folder. If you're having problems, you can force them to work in a special quarantined environment.

Right-click on the icon belonging to the legacy application and choose Properties from the menu. Go to the compatibility tab and enable 'Run This Program as an Administrator'.

The program will now run in an emulated administrative space, with only virtual access to the operating system.

If you enable this under a non-administrative account you'll be presented with a one-time prompt.

LINUX TIP

COLLECT USEFUL DEBUGGING DATA

Do you like staying on the cutting edge of open-source development, installing beta or even alpha versions of your favourite apps? If you do, then more often than not you'll have the app crash on you, dumping core and exiting. Instead of attributing this behaviour to the under-developed nature of the app and letting it pass by, you can use your initiative and actually help the developer.

Most mainstream distros include a useful little app called Valgrind. This utility can run other applications on a software-emulated CPU and watch their every move, keeping an eye out for memory leaks and other programming errors.

To allow Valgrind to profile an application, start it like this:

```
valgrind --log-file=/tmp/abidump abiword
```

This command starts the application (Abiword in this case) on the Valgrind software CPU (which is why it runs so slowly). As the program executes, Valgrind records any errors, memory issues and generally what the program was getting up to at the time in the log file specified.

Now, when you email the developer of the buggy application, as well as describing the actions that cause the program to misbehave, you can attach the Valgrind report, which will make more sense to him than normal language ever can.

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apcmag.com.au or www.magshop.com.au for back issues of APC

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WINDOWS VIEW

Open source

Although open source software is synonymous with Linux, Windows users can get plenty of benefit from it too.

APC EXPERT

JAMES BANNAN

James Bannan is a systems manager at St Leonard's College (Vic) and *APC*'s resident Windows expert.

'Open source' and 'Windows' are not phrases generally heard in the same sentence, but here's a list of the open source stuff for Windows that I just can't live without.

PUTTY

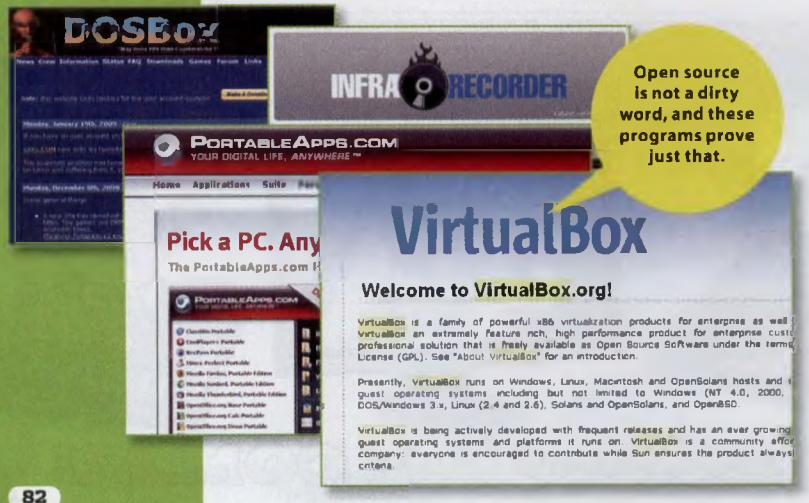
This is a telnet/SSH client that is perfect for administering routers, switches and Linux servers. If you maintain a lot of saved sessions, try using PuTTY Session Manager too; this needs .NET Framework 2.0, but is more intuitive.

INFRARECORDER

I used to use Nero, and now I don't. InfraRecorder is a lightweight burning/imaging tool that handles data, audio and mixed mode projects, can create ISO or BIN/CUE images and can extract music files. It can burn to dual-layer DVDs, but it doesn't do video compilations. Supports 32/64-bit.

WIRESHARK

This is what became of Ethereal — Wireshark is a traffic sniffer and protocol analyser and a network admin's best friend. It gives you a graphical rundown of every packet your machine can see and is perfect for tracking down miscreants, troubleshooting routing issues or network loops and even capturing VoIP packets.



VIRTUALBOX

I first came across this when writing virtualisation tutorials for **apcmag.com**, and was staggered by just how good it was. And since then it's become my default desktop virtualisation solution for writing tutorials, testing new systems and building labs.

PORTABLEAPPS

I have a portable drive that carries my life on it (and yes, it's all backed up), and having PortableApps adds that much more functionality. There are plenty of useful applications that have been ported across, including almost every single app on this list! The advantage is that your portable drive becomes more of a useful tool rather than just somewhere to house data, and the functionality is available everywhere.

WINMERGE

Lets you compare files and folders for similarities and differences and easily port changes across. This is great when editing multiple configuration files or moving large amounts of data around.

DOSBOX

OK, not exactly a work tool, but when you're looking for some retro downtime (and don't want to watch *Back To The Future*) then DOSBox is your friend. It's a DOS emulator that lets you play those old and awesome games you grew up with on today's high-end hardware.

FFDSHOW

This is a DirectShow decoding filter for a wide variety of digital video formats including XviD and H.264. The quality is outstanding, and it's definitely a one-stop shop for your media needs.

The best open source software meets a niche need and fills it completely, and all the packages on my list do just that. They're lightweight, reliable and slick — so get downloading! APC

LINUX

Extended evolution

To Ext3 or not to Ext3, that is the question. This month, we take a look at the pros and cons of upgrading to Ext4.

APC EXPERT

ASHTON MILLS

Editor of the Linux Pocketbooks series, and now with *CHOICE magazine*, Ashton has been a tech journo for over 13 years, including five years with *APC*.

While there are many filesystems you can use with Linux, including names big and small (such as XFS, JFS and ReiserFS), the staple for most Linux systems is still the humble but solid Ext3 (third extended filesystem). And while it's sometimes not as fully featured as its larger couterparts, it still offers good speed and, importantly, stability. But just as Ext3 superseded Ext2, so too Ext3 will be superseded by the up-and-coming Ext4 — which recently made it to the mainline kernel tree.

Ext4 brings with it a number of new features and improvements, including large volume and file size support (up to 1 exabyte and 16 terabytes respectively), extents (helps performance on large files and reduces fragmentation), delayed allocation (faster performance and helps to reduce fragmentation), multiblock allocation (improves performance and helps reduce fragmentation), and faster filesystem checks among others.

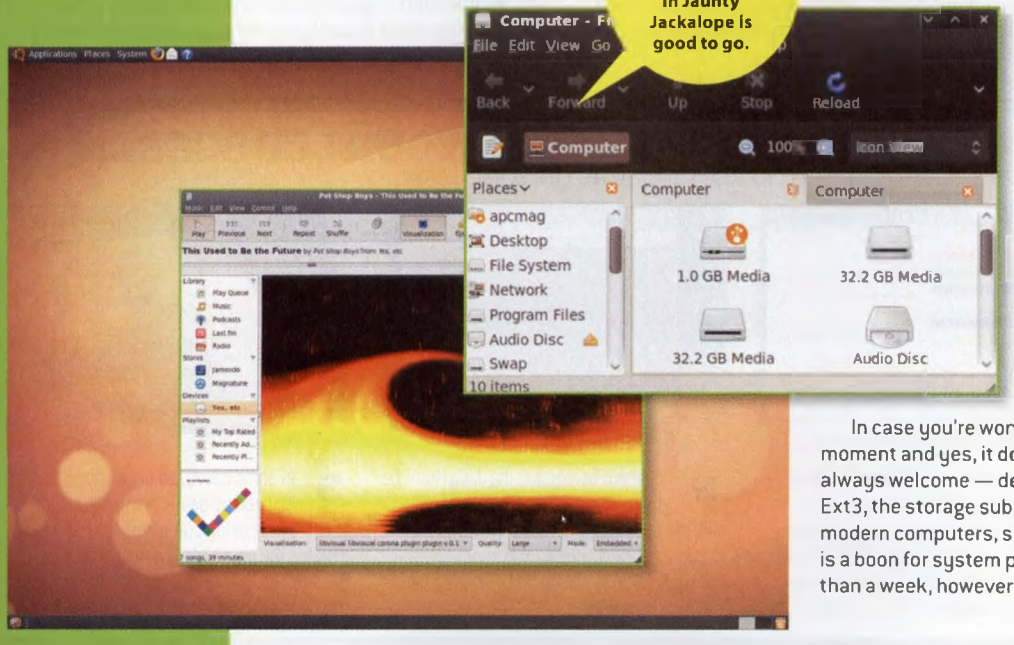
Now that's in the mainline, the opportunity is there for distributions to start enabling it, and this is exactly what Canonical did with Ubuntu 9.04. And, while it is an option for the installer, it's not however the default — but it wasn't going to be this way. Originally the plan was to have Ext4 be the default for Ubuntu from 9.04 and going forward, and even though it was 'stable' enough to be added to the mainline kernel, in the last few months, as it gained exposure, reports started to surface about data loss.

The issue is complex, but the gist is that programs that choose to update files using a rename-write-remove method can lose data in the event of a crash where, given the same situation, Ext3 wouldn't.

The problem, it turns out, is related to the new delayed allocation feature that brings Ext4 up to speed with heavyweights like XFS. Technically, the filesystem isn't at fault. Among heated discussion online, it was said the issue was more about developers who expect it to behave the same as Ext3, where the default flush of five seconds saw data more likely to be written than the larger window delayed allocation on Ext4 provides. And that, ultimately, it would be for developers to write their programs to be more compliant. Which didn't go down too well.

One suggestion was to explicitly call an fsync() to force an immediate flush for any data considered critical, but this has its own issues — for one, a program that needs to frequently update critical files will cause a performance impact by having all data flushed frequently to disk. And then there's the fact that programs would need to be updated to do this, not a small task.

And so the end of a lively debate tried to find a middle ground and resulted in a series of patches that effectively ensure Ext4 behaves like Ext3 with respect to ordered writes, which on the one hand fixes any possible data loss but at the same time negates some of the performance advantages the new filesystem brings, at least for the moment. These patches are scheduled to be in the up-coming 2.6.30 kernel, however, have already been back-ported by some distributions: Canonical added them to Ubuntu 9.04's 2.6.28 based kernel and so — in case you're wondering — the Ext4 implementation in Jaunty is good to go. Though, just because, do make sure you've got a backup of any data you plan to use with an Ext4 partition, as there hasn't been extensive results from their use in the field.



Discussions are ongoing, as the patches aren't an ideal solution — hobbling performance to emulate an old style weakness of Ext3 isn't the best way to move forward. One proposed solution is to implement a function precisely for file updates, thereby allowing programs to effectively fsync() just for a particular file. It's a good solution, but again would require developers to update programs.

In case you're wondering, yes I'm using Ext4 at the moment and yes, it does appear to be snappier, which is always welcome — despite the naysayers sticking hard by Ext3, the storage subsystem is still the bottleneck of all modern computers, so anything that can improve this area is a boon for system performance. I've been using it for less than a week, however, so we'll have to see how it goes!

BUILDING A PC

Fix dead pixels on your LCD monitor

A dead pixel on your monitor may not be terminal. Here are some tips on how to resurrect it.

APC EXPERT

SIMON PICKSTOCK

Simon is a PC maintenance expert.

Game over? Not necessarily: check out Simon's tips on how to deal with pesky 'dead' pixels.

Although the term 'dead pixels' is commonly used to cover all types of pixel fault, there are actually three distinct subcategories: stuck pixels, hot pixels and dead pixels.

To understand why dead pixels occur, it helps to know how an LCD monitor works. In order to generate all the colours of the spectrum, each pixel is made up of three subpixels — one each for red, green and blue light. When all three subpixels are on, the pixel is white, and when all three are off the pixel is black.

If one or two of these subpixels remain on and won't switch off, the pixel will appear as a solid red, green, blue, cyan, magenta or yellow dot on the screen (depending on which subpixels aren't working). This type of pixel fault is called a stuck pixel. When all three subpixels are stuck on, the pixel will appear to be permanently white. This type of pixel is known as a hot pixel. Dead pixels are either whole pixels or subpixels that do not turn on. These pixels always look black.

When LCD panels first started to become popular, stuck and dead pixels were quite common and would often appear in clusters.

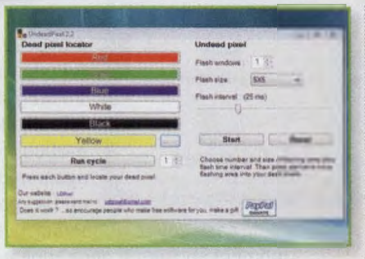
Too many faulty pixels can render a monitor worthless, so the ISO 13406-2 standard was created to define the maximum number of faulty pixels that are permitted for any given class of display. A Class One panel can't have any faulty pixels, but a Class Four panel can have up to 50 permanently white pixels.

Stuck pixels are usually caused by manufacturing defects, and they will often stay illuminated for the life of the panel. In many cases it's possible to fix the pixel using either software tools or manual manipulation. The software solution will generally flash a series of images that vary in colour and intensity onto the screen in an attempt to unstick the pixel. Manual manipulation involves gently pressing on the affected area with something like a pencil eraser. Doing this compresses the layers of the panel, forcing the oil within the panel to move. Be careful, though: this is by no means guaranteed to work, and it could create even more stuck pixels or move the problem to elsewhere on the screen rather than repairing it.

Dead pixels and hot pixels are generally the result of faults in the circuitry of the panel. It's usually the case here that the transistor does not switch states properly. Dead pixels generally mean that the transistor has failed completely, and this is rarely fixable. Hot pixels may be due to manufacturing defects. They can often be fixed in the same way as stuck pixels, but again, success is not guaranteed. If you have stuck or dead pixels, we recommend you try a software solution and only press on the screen as a last resort, as you could end up damaging the panel further. UDPixel (**http://udpix.free.fr**) is a program that tries to find and fix faulty pixels, as does JScreenFix (**www.jscreenfix.com**). If your screen is new and seems to have an excessive number of faulty pixels for its class, you should contact the manufacturer for a replacement instead.

HOW TO FIX STUCK PIXELS ON YOUR LCD SCREEN

TRY THESE TECHNIQUES TO EFFECT REPAIRS ON YOUR DISPLAY



1 UDPixel will attempt to detect and fix problematic pixels for you by changing the screen colour to highlight any problems. Once a fault has been found, you can choose the size of the square and the flash speed to start the fixing process.

2 JScreenFix requires the Java Runtime environment. Go to the JScreenFix site, start the applet and then press F11 to maximise for full screen. You should leave the application to run for an hour or so before viewing the results.

3 In some cases, stuck subpixels can be fixed by gently pressing on the affected area using something that won't damage the panel, like a pencil eraser. Be cautious, however. This method isn't guaranteed and can make things worse.

APC EXPERT

TONY SARNO

Tony is the editor of *APC*, but is frustrated that his jazz musician namesake hogs all the Google search returns.

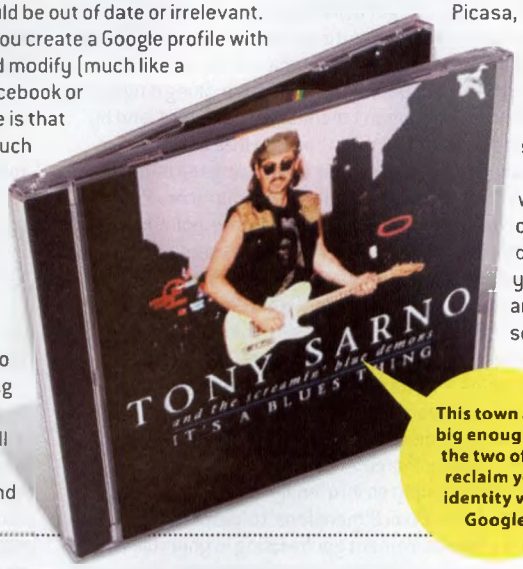
ONLINE

Control your Google profile

Google lets you create a profile that will appear further up in the search results whenever someone Googles you.

Googling yourself can be an exercise in frustration. You might appear way down in the search results and find only random information that could be out of date or irrelevant. To remedy this, Google lets you create a Google profile with information that you add and modify (much like a profile that you create on Facebook or LinkedIn), but the big change is that the profile will now appear much further up the Google search results. In other words, searchers will actually see it. The Google profile now also has a user-friendly URL, in my case, **www.google.com/profiles/tonyacp**, and allows people to contact you without revealing your email address.

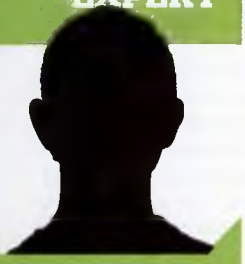
To create a profile, you will need a Google account. Go to **www.google.com/profiles** and fill in the questions. In addition to basic info, it asks about your interests, favourite links and lets you add photos from Picasa, Flickr and other services. In effect, you now have a page that's your official face to the world and which people are more likely to find than anything you have on any particular social networking service.



This town ain't big enough for the two of us: reclaim your identity with Google.

Given that several other users with the same name could also create a profile, try and add as much distinguishing information to it as you can, such as your town, job title and employer and where you went to school. In my case, I fight an ongoing battle with a Nashville jazz musician for recognition in Google results, so this will go some way to letting people find me. BTLC

APC EXPERT



LI FANG JEI

Li wanted to buy an XO laptop from the OLPC project but instead has settled on getting the software to work on his USB stick.

USER INTERFACE

Run OLPC on a USB

You can run the revolutionary Sugar UI used on the One Laptop Per Child laptops on a USB key or Virtual Box.

While people think of low-cost when you mention the OLPC project and the XO laptops it created for children in developing countries, they gloss over one of the cool features of the project: the revolutionary Sugar interface. The Sugar UI is different because it tries to more accurately capture the way kids use and share information with other kids and teachers. There are no traditional software applications on the XO laptop; rather, a bunch of activities and seamless collaboration.

Now, a group called Sugar Labs has created The Sugar on a Stick project, which is able to make Sugar run on a single USB key as small as 1GB in capacity. Based on a stripped-down Live USB version of Fedora, the USB-version of Sugar UI is identical to that on any XO laptop, the idea being that children would be able to use the same environment on any computer, not just the one machine at school.

Go to Sugar Labs' home page **http://tinyurl.com/cfme93** for the download link of the software to install on your USB. You'll need to tweak your Bios so it's able to boot from a USB key, but if you have an older computer, you can download an ISO for a Boot Helper CD that boots off the CD but reads the files on the USB key. Alternatively, you can run Sugar from a virtualised environment such as Virtual Box, which comes in versions for Windows, Linux and Mac OS, with instructions at **tinyurl.com/cfme93**. BTLC

Got Sugar? The revolutionary UI is available outside the OLPC project...

PHOTOSHOP

Blowing up an image

How to make an image larger without losing too much resolution.

APC EXPERT

LEIGH D. STARK

Leigh D. Stark has an obsession for all things with the word "photo" in them and is rarely caught without a hat. He can often be seen teaching photography and has an almost unhealthy obsession with technology.

Making an image larger can sometimes be a costly affair. With Photoshop, you get a plethora of expensive plug-ins to choose from, including solutions from Alien Skin & OnOne that use a whole bunch of mathematical algorithms to increase the size of your image without making it ugly.

But Photoshop doesn't technically need that, and by using the so-called 110% method you'll be able to make almost any image larger without spending too much time on it. The 110% method is known to the hardcore Photoshop junkies who've had to dabble in image interpolation (or, making pictures bigger). It's sadly not as simple as going into 'Image size' and just changing the numbers to accommodate the print size you want. While Adobe's bicubic filtering technology gets better, all you're really doing is stretching the pixels in one giant move. Doing something like this yields a picture where the increased pixel dimensions are more easily noticed throughout the image.

But the 110% method cheats this by using Adobe's resizing in smaller increments so it's less noticeable.

To use this, simply go into 'Image size' and change the width field under 'Pixel Dimensions' to 'percent'. No matter what unit of measurement you're using in your rulers, this will only give you a choice of 'pixels' or 'percent'. Right now you want percent, so change that under width and the height should follow automatically. Make sure that both 'Constrain proportions' and 'Resample image' are checked, otherwise this won't work.

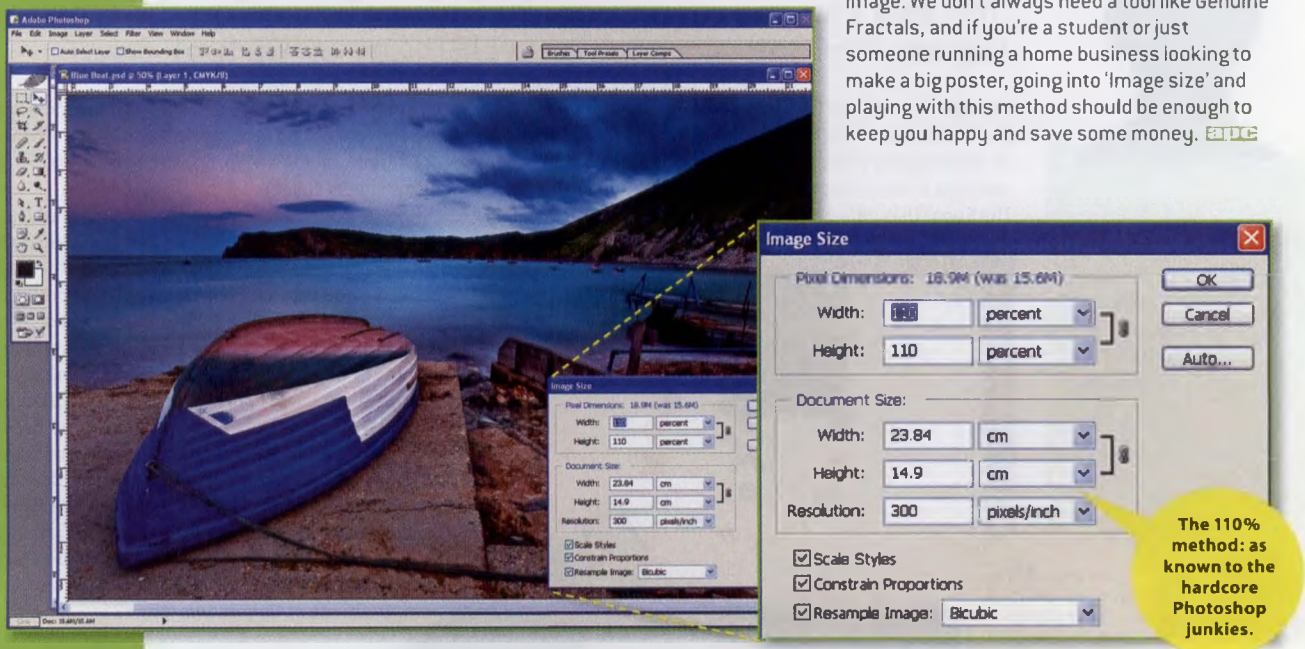
Enter '110' in either width or height and the number should appear in the other field. Now press OK.

Congratulations, you've just cheated the system and resampled your image by 110% which — by itself isn't a huge difference — but after doing it a few times, you'll find you've stretched your image to a large enough size without doing any damage.

There is one little catch with this whole thing. The 110% method works great for images that you're blowing up to say A3 or A4, and it works well for images that you're standing back from, like larger billboard image sizes. But the moment you troll the web for a 500-pixel image and decide to make it bigger, this enlargement method falls flat on its face. Once the pixels have already been made too small, there isn't a whole lot for anyone — not even the expensive plug-ins — to work with. Once you start trying to play with images that have under around 800-1,000 pixels across (height or width), you'll find that there isn't a whole lot you can do, short of making it stylised by using a filter or two.

> CONGRATULATIONS, YOU'VE JUST CHEATED THE SYSTEM

Regardless, the 110% method fills that gap for those odd times you need a larger image. We don't always need a tool like Genuine Fractals, and if you're a student or just someone running a home business looking to make a big poster, going into 'Image size' and playing with this method should be enough to keep you happy and save some money.



The 110% method: as known to the hardcore Photoshop junkies.

DEFRAGGING

Maintain your drive

Our full-version cover disc software, DiskRescue 2009, helps you keep your hard drive in the best of digital health.

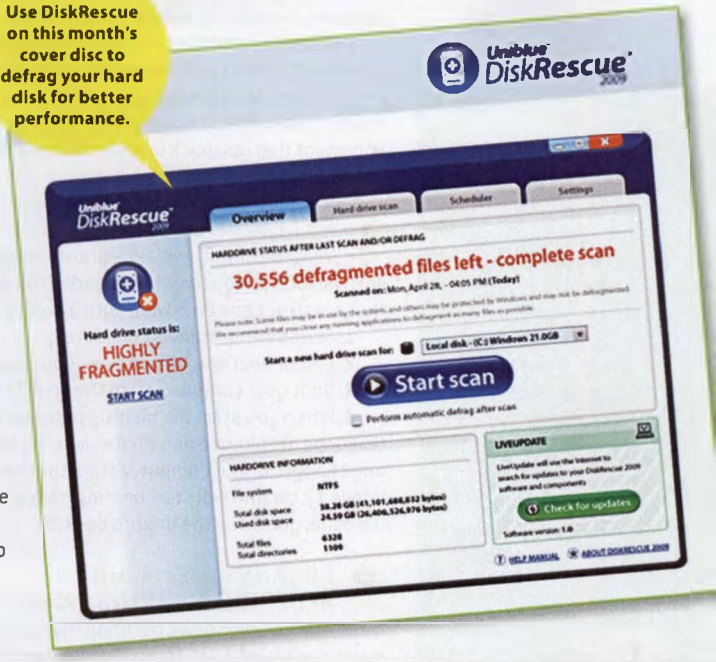
If you want to get the best performance out of your machine, you really need to keep your hard drive in tip-top shape. The hard drive is pretty much the heart of your computer's storage system. Every time you need to access data that's stored on your hard drive, your machine needs to mechanically retrieve it. In terms of achieving high system speed, RAM and CPU are certainly of critical importance, but all the high-end components in the world won't help you if your data access is delayed by an interminably slow, neglected hard disk. This is where this month's cover disc software, DiskRescue 2009, comes to the rescue.

DiskRescue is a defragger program: it defragments the incremental gaps that appear on your hard disk over time due to regular usage (deleting and moving old files etc.). The problem is that, once a hard disk has had a reasonable amount of use, the number of gaps where data once resided are numerous, and so it takes longer for your hard drive to locate the files you *do* want to access. Fixing this simple (but serious) problem is what DiskRescue is all about.

So, grab this month's DVD, select DiskRescue 2009, save the install file to your hard drive and run it. Once you have installed the program you need to register it to activate the full version functionality (it is a commercial product, after all). To register DiskRescue, visit this link (**http://mag.uniblue.com/apcmag/au/signup/**) and enter your name and email address. Once you have been emailed the serial number, copy it and click the 'Register now' button in the bottom-left corner of the application's window. Paste the serial into the field and hit the 'Activate now' button. Once registered, to launch DiskRescue, go to 'Start > All Programs > Uniblue > DiskRescue 2009'.

When you're running the program, you'll note there are four main tabs across the top: 'Overview' gives you a broad view of your drive's scan status; 'Hard drive scan' gives you an update on drive information; 'Scheduler' enables you to set regular defrags (recommended); and 'Settings' lets you control DiskRescue's preferences. To start a scan of your disk, just hit 'Start scan', which is featured prominently on the 'Overview' and 'Hard drive scan' pages (note that automatic defragging post-scanning is a checkable option). For more comprehensive support, DiskRescue's manual can be downloaded here: **www.liutilities.com/support/manuals/**.

Use DiskRescue on this month's cover disc to defrag your hard disk for better performance.



APC EXPERT

PETER DOCKRILL

Peter Dockrill is APC's DVD Editor. He also edits the Chip Chat column, in addition to writing occasional reviews and sub-editing the magazine. He formerly edited APC's Watchdog section, and he contributes as a technology writer to Money Magazine.

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BUILDING A PC

Removing persistent malware

Some malware seems impossible to find (or get rid of). So APC approached an Eastern European security guru to find out how. . .

APC EXPERT

SERGEI SHEVCHENKO

Sergei Shevchenko is an international authority on the behaviour of computer viruses, worms, trojans, spyware and other security-related risks. A a senior malware analyst at PC Tools, he is responsible for the development of the Threat Expert product. He holds an Engineering Diploma, with Honours from the Technical University of Moldova.

It's worth learning a manual removal method for malicious software such as viruses, spyware, keyloggers, Trojan horses and worms that can't be got rid of any other way. It involves booting your computer from a different partition that is known to be clear of malware, and then deleting malicious files that reside on the affected partition. This way, the files that reside on the affected partition are not obstructed from being seen or manipulated (for example, any possible rootkits will be inactive at this stage).

Please note that the following instructions do not provide a failsafe recipe for removing malware. If you're unsure about the purpose of the file that you intend to delete, please do not attempt this method. It's also important that you back up your files and documents before attempting this!

1 GET UBUNTU

Visit the Ubuntu web site and download the Ubuntu software. Once you have downloaded the ISO image, follow these instructions on how to burn a bootup CD or DVD:

1. Shut down Windows completely.
2. Disconnect any USB devices you may have plugged in.
3. Boot your computer from the LiveCD.
4. When you start the boot-up process, choose your language preference and then select 'Try Ubuntu without any change to your computer' from the menu options (see image 1). Ubuntu will start booting from your LiveCD. When it's done, you'll see the Ubuntu desktop.

2 LOCATING AND MOUNTING AFFECTED WINDOWS PARTITION

Next, find your Windows partition that contains the malicious file(s). Click Menu item 'Places', then 'Computer'.

The File Browser will fire up and show a panel similar to the one in that you can see (in image 2).

Your Windows partition will most likely be depicted with an icon of a hard disk drive titled as '[X] GB Media', where X is the size of your partition in GB. The icon should appear different from the 'Filesystem' one — it will not have a little green indicator in it because it is not mounted yet.

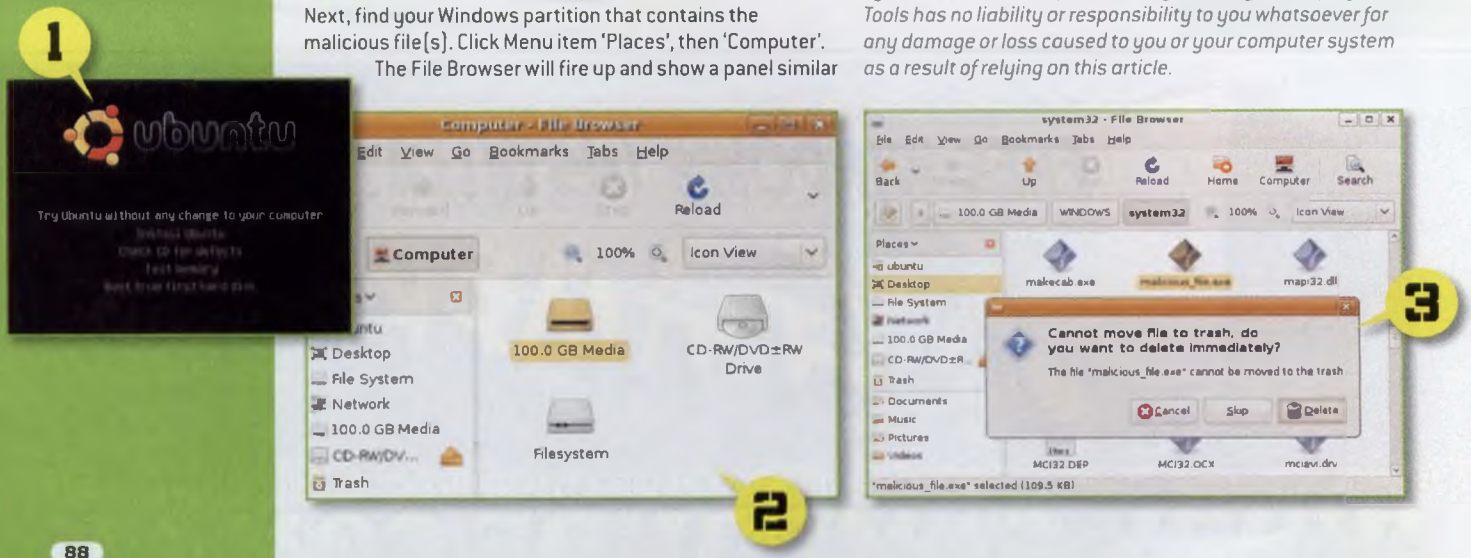
If there are several partitions, there will be several '[X] GB Media' icons; you will need to identify which one has Windows installed on it — it's not necessarily the first one displayed. Right-click your mouse over the hard disk icon and select the 'Mount Volume' option — its icon should show a green indicator.

3 LOCATE AND RENAME/DELETE MALICIOUS FILE(S)

In the File Browser, double-click an icon of the mounted partition to inspect the directories and file names on that partition. You should be able to recognise your Windows partition by its contents: navigate to the directory where the malicious file is located. (See image 3.)

From here, the file can be renamed or deleted. Once the malicious file is renamed or deleted successfully, shutdown Ubuntu (shown below), remove LiveCD, and power on your computer to start up Windows again — the malicious file should have disappeared from your computer.

DISCLAIMER: This article has been prepared solely for information purposes and does not purport to contain all of the information that you may need to remove malware. You assume all risk in removing the malware from your computer system. To the extent permitted by law, Sergei's employer PC Tools has no liability or responsibility to you whatsoever for any damage or loss caused to you or your computer system as a result of relying on this article.

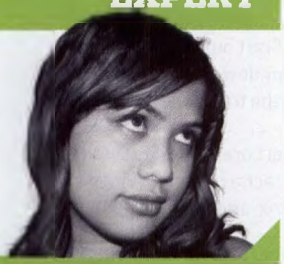


IPHONE

Save on your iPhone bill by jailbreaking

Why pay for your calls when you can use the internet instead?

APC EXPERT



JENNETH ORANTIA

An expert on all things mobile, Jenneth Orantia has been writing reviews and tutorials on smartphones for the last seven years. Her current phone of choice is the iPhone 3G, but she's also well-versed in Windows Mobile, Symbian, Palm and BlackBerry.

It's a well-known fact that you can get extra perks by jailbreaking your iPhone: an MMS client, video recording and the ability to customise the user interface, amongst others. But did you know that you can also make big savings on your phone bill? Using BiteSMS and Skype, you can bypass your carrier's network and use the data included in your plan (which you're probably not even getting close to using up each month) to route text messages and calls over the internet. Jailbreaking has gotten a lot easier compared to the early days, so if you haven't yet done it, all you need to do is upgrade to the latest iPhone firmware version (2.2.1) through iTunes and then run QuickPWN (**www.quickpwn.com/downloads**) on your Windows or Mac computer to do the rest.

CHEAPER TEXT MESSAGES

Once you've jailbroken your iPhone, you'll get a new Cydia icon on your home screen. Click on the Search icon at the bottom of the screen and type BiteSMS in the search bar. Tap the BiteSMS application in the search results, then click on the 'Install' option in the top right-hand corner of the details page. BiteSMS (**www.bitesms.com**) offers a 10c flat rate per text message anywhere in the world — a fair bit cheaper than the 25c each charged by each network for local text messages. The savings are even more if you text friends and family overseas — Vodafone charges the same 25c for international SMS, but Virgin Mobile charges 35c and Telstra and Optus charge 50c a message.

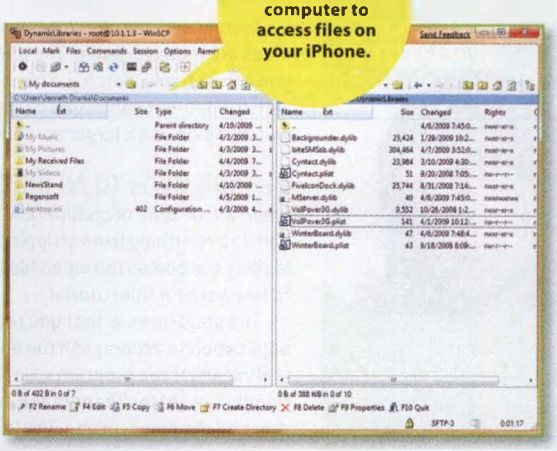
Install BiteSMS from the Cydia application and you'll be able to send text messages internationally at 10c a pop.

CHEAPER CALL RATES

By default, you can only make calls using the free Skype application if you're connected to a Wi-Fi network. With a jailbroken iPhone, however, you can bypass this limitation and use it over 3G.

Install Skype from the App Store, then open Cydia and install the VoIPover3G, OpenSSH and Mobile Substrate applications (the latter should already be installed, but make sure you have the latest version) on your iPhone. On your computer, you'll need to install an SSH/SCP program to wirelessly access the file structure on your iPhone. The freeware WinSCP program (**www.winscp.net/eng/downloads.php**) works well on PCs and Cyberduck (**http://cyberduck.ch**) is equally good for the Mac platform.

Hack the Skype for iPhone application to enable VoIP calling over 3G.



Use an SFTP program on your computer to access files on your iPhone.

After you've installed all the applications to your iPhone, reboot it (press and hold on the screen lock and home button until the 'slide to power off' screen appears), then connect it to your wireless network. Go to 'Settings > Wi-Fi' click on the arrow next to the name of your wireless network and note down the IP address listed. Next, open the SSH/SCP program on your computer. Make a new SFTP connection using the IP address you noted down in the previous paragraph as the server/host name, with username: root and password: alpine. Click Connect, and it will connect to your iPhone (make sure your iPhone hasn't gone into standby mode, as this will automatically turn the wireless connection off). Navigate to the top level of folders in the folder tree and drill down to 'Library/MobileSubstrate/DynamicLibraries'. Open the 'VoIPover3G.plist' file and replace the text in it completely with the following text:

```
Filter = {Bundles = ("com.Fringland.Fring", "com.apple.
AppStore", "com.audiofile.Interstate", "com.apple.
MobileStore", "com.skype.skype");};
```

Save the file, and depending on the program it will overwrite the old file, or you'll have to drag and drop it back into the folder. Next, uninstall Skype from your iPhone (tap and hold on its icon in the main menu screen and press the cross button), reboot and reinstall it again. You'll now be able to take advantage of Skype's low local and international call rates over both Wi-Fi and 3G!

IPOD

Portable movies

Use your iPod classic as a portable video player.

Unless you're an audiophile with a music collection spanning several terabytes, chances are that you haven't even come close to filling your iPod classic to capacity. But it's a shame to let all of that storage space go to waste. If you're a movie buff, you can use the rest of your iPod's hard drive to keep backup copies of your DVDs.

Technically, you could do this on any hard drive, but iPods are more versatile. The built-in 3.5in screen means you can actually watch the movies that are stored on it, and with a video-out cable, you can also connect it to a TV and watch movies on a larger screen.

RIPPING DVDs TO AN iPOD-FRIENDLY FORMAT

There are dozens of commercial programs available that can do everything from stripping the DVD of encryption to loading the converted video file to your iPod, but we'll stick to freeware for this tutorial.

The good news is that you really only need one application to accomplish the entire process. Well, technically three programs: Handbrake, VLC and iTunes. But Handbrake (**http://handbrake.fr**) is the program that will be doing all the heavy lifting. The latest version has removed native support for ripping DVDs, but you can add this feature back in if you install an older version of VLC player (**http://download.videolan.org/pub/videolan/vlc/0.8.6i/**).

Once you've installed both applications, insert your DVD, then open HandBrake and click the Source icon in the top left hand corner. The name of your DVD should appear as the last item in the menu. Click on it, and a window will appear saying that it's reading the source. Wait for it to finish processing.

Handbrake will automatically select the longest file in your DVD folder to rip, displayed in the title field with the total duration next to it in parentheses. On the right-hand side are presets that you can choose for encoding to particular formats. Click on the iPod preset. If you're cluey about bitrates and codecs, there are lots of different settings you can tweak to optimise the final video, but the default settings should be fine for most users.

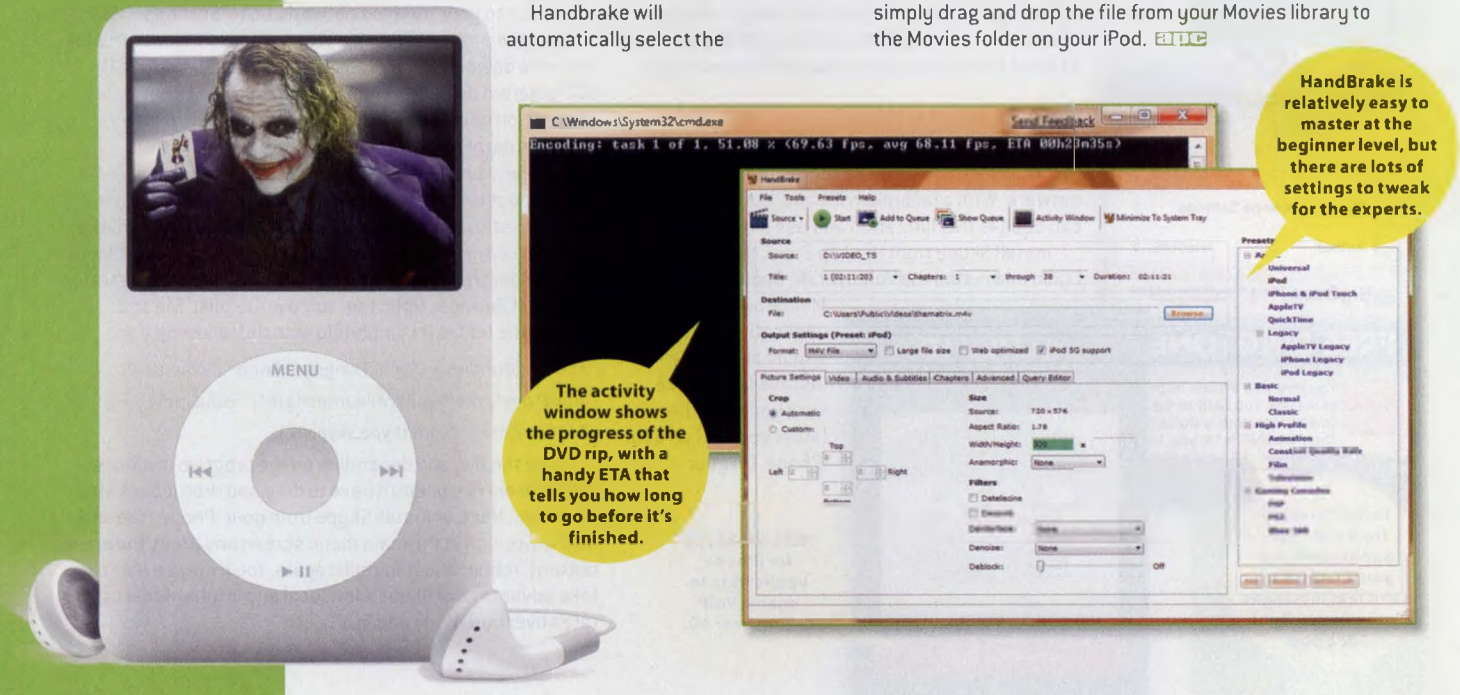
Click on the Browse button in the Destination field to specify where the file will be saved to and give it a name. Click Save, then click the Start button from the main window. A command prompt window will appear with a progress indicator, including the total time it will take to complete.

On our test machine (a 3GHz Intel Core 2 Duo iMac with 2GB of RAM, 1GHz FSB and 6MB L2 cache running Windows 7), it took 40 minutes to rip *The Matrix*, and the final file was 671MB.

The great thing about Handbrake is that you can queue up a bunch of movies to encode. Of course, if you're ripping DVDs straight from the disc, you'll still need to be around to remove the previous disc and insert the new one, but if you're transcoding DivX or XviD files to an iPod-friendly format – or have the DVDs saved to your hard drive – you can queue these up one after the other.

TRANSFERRING THE VIDEO FILE TO YOUR iPOD

The last step is the easiest. Connect your iPod to your PC and open iTunes. Click 'File > Add File to Library', navigate to the video file you created in the previous section and click 'Open'. If your iPod is set to automatically sync, then the video file will be transferred. If you're on manual sync, simply drag and drop the file from your Movies library to the Movies folder on your iPod.


MENU
The activity window shows the progress of the DVD rip, with a handy ETA that tells you how long to go before it's finished.
HandBrake is relatively easy to master at the beginner level, but there are lots of settings to tweak for the experts.

APC EXPERT

JENNETH ORANTIA

An expert on all things mobile, Jenneth Orantia has been writing reviews and tutorials on smartphones for the last seven years. Her current phone of choice is the iPhone 3G, but she's also well-versed in Windows Mobile, Symbian, Palm and BlackBerry.

SOCIAL NETWORKING

Finding a job with Twitter

Find a job in 160 characters or less.

APC EXPERT

SAMANTHA ROSE-HUNT

Samantha is a young internet writer fascinated by the impact of social networking services such as Twitter and Facebook on how we live and work, not just how we socialise.

With the economy in a downward spiral, many people have lost their jobs and are hunting for new ones. One of the most popular methods of finding a job these days is through Twitter, the microblogging web site designed to deliver instantaneous updates to friends and family. Even if the maximum number of words you can publish in each Twitter post is only 140 and your Twitter bio takes up to 160 words, the service can still help you find a job.

SELF MARKETING IN LESS THAN 160 CHARACTERS

If you already have a Twitter account, it is important that you create one that will be used strictly for business or professional use rather than for personal tweets, since you want it to reflect your professional persona. Go to the Twitter Bio section ('Settings > Account') to create a self sales pitch. Even though the bio field is tiny, it can fit up to 160 characters in it, so try to come up with a tiny CV that broadcasts your abilities and skills. Make sure your photograph is either a professional headshot or something that is safe for work: not a shot of you nightclubbing or kissing a friend. It's all about showcasing yourself, so leave your friends and family out of the photo.

Your Twitter profile allows you to link to a web page via the More Info URL link, so use that to publish an extended online resume or CV.

BUILD YOUR AUTHORITY

When 'Tweeting' each day make sure you establish yourself as an expert in your field. Tweet about news in your industry, make sure you use words and phrases that reflect your skillset and expertise. Remember, each post is only 140 characters, so it's not like a blog where you need to write several hundred words each time. You might begin to have a following from people that search for experts in particular areas, but always be honest and represent yourself and your skills correctly. The internet is permanent, so be aware that what you say and do will always remain on record somewhere.

> ONE OF THE MOST POPULAR METHODS OF FINDING A JOB THESE DAYS IS TWITTER

MAKING CONNECTIONS 'TWEET-BY-TWEET'

Twitter is a public forum and is increasingly used by recruiters and potential employers to seek out candidates. When you are thinking of reaching out and contacting a potential employer or recruiter you'll want to research them as they would research you: read their personal bios, study their web sites, and search for them on Google. You want to make sure they are professional and credible. Protect yourself as much as possible.

KEEP AN EYE OUT FOR JOB-HUNTING RESOURCES

More and more job-hunting resources are appearing on Twitter. Generally they are channels from various industries or cities in which people post job ads or requests for jobs. New openings can be forwarded to your mobile phone and you can subscribe to specific job channels. Most are overseas-based, but when we went to print there were at least 10 from Australia.

You can also use the search function to look for company and industry-specific opportunities. By searching for items like 'marketing opportunity', 'sales representative position', 'company hiring' etc., you might turn up real-time results which you can reply to. Good luck.

twitter
Home Profile Find People Settings Help Sign out
10 results in 0.103 seconds
Name results for: jobs australia
jobs australia
search
Did you mean jonas australia ?
MediaJobsinAUS / Media Jobs Australia Hottest and Highest Paid Media Jobs in Australia. Delivered every few hours.
148 followers
GreenJobsinAUS / Green Jobs Australia Hottest and Highest Paid Green Jobs in Australia. Delivered every few hours.
138 followers from Australia updated about 6 hours ago
ITJobsAustralia / IT Jobs in Australia Hottest and Highest Paid IT Jobs in Australia. Delivered every few hours.
131 followers from Australia updated about 8 hours ago
SalesAustralia / Sales Jobs Australia Hottest and Highest Paid Sales Jobs in Australia. Delivered every few hours.
101 followers from Australia updated about 8 hours ago
LawJobAustralia / Legal Jobs Australia Hottest and Highest Paid Legal Jobs in Australia. Delivered every few hours.
76 followers from Australia updated about 6 hours ago
SEOJobsinAUS / SEO Jobs Australia Hottest and Highest Paid SEO Jobs in Australia. Delivered every few hours.
75 followers from Australia updated about 10 hours ago
jobsnaustralia / Jobs in Australia Jobs in Sydney, Melbourne & Canberra
68 followers from Australia updated about 2 hours ago
australiaseo / Australia SEO jobs
43 followers
Didn't find who you were looking for?
Enter the email addresses of folks to invite
Find people on other networks »

Make sure your Twitter identity is maintained professionally.

OPEN SOURCE CHALLENGE

Ubuntu 9.04

A milestone in Ubuntu's development is upon us... so what can we expect?

Since the original Open Source Challenge we've made a point of following each new Ubuntu release to not just see what's new and what's improved, but also whether the goal of an easy to use, intuitive, and powerful Linux desktop is coming closer. The original Open Source Challenge set out to see if Linux, and specifically Ubuntu, could be a full-time Windows replacement: want for nothing. It concluded that it was a viable alternative, but with a number of caveats — areas we felt Ubuntu let itself down, or where Windows simply did it better. And even though there's been some improvement since then in recent releases, there's room to grow. Unfortunately, 8.04 took some steps back with myriad issues introduced, and while 8.10 improved things it's fair to say everyone has been waiting with bated breath to see if the next major leap to Ubuntu 9.04, aka. Jaunty Jackelope, would be a finely polished release.

Now it's here, lets take a look to find out.

INSTALL

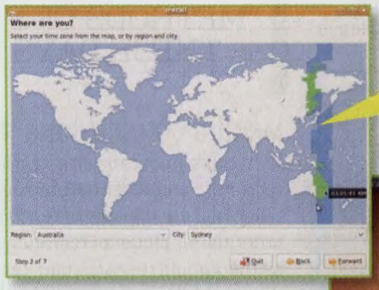
Nothing much has changed from the LiveCD install on 9.04, apart from further graphical updates (the timezone selection is now a banded map, and the graphical partitioner has had further useability improvements) but it was extremely zippy installing to a new Ext4 partition (more on this below). In fact on our Intel E8600-based machine, after completing the setup wizard, the actual install time from copy to prompting to reboot was less than four minutes. The Windows 7 beta on this machine, while a speedier install than Vista, was still magnitudes longer to install. I think the last Microsoft operating system that could be installed this fast was MS DOS. That there's little more to say about the install is a good thing — it should be, and is, a painless and quick process. Ubuntu has done very well here.

FIRST IMPRESSIONS

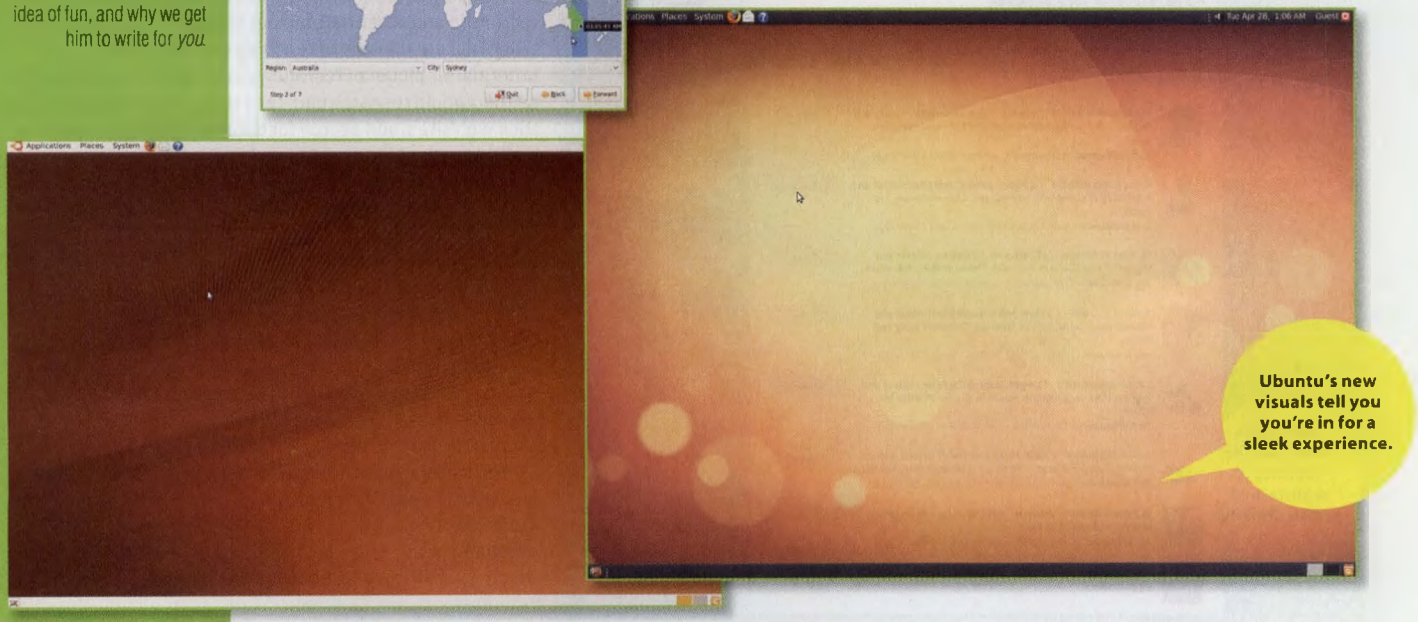
On reboot the new splash screen with its thinner and tinted progress bar hints at a sleeker release, backed up by the fact 9.04 boots considerably faster. From the GRUB boot menu to the login screen, it took just 23 seconds. Ubuntu 8.10 on this same box takes 42, and Vista 51. That's half the speed of Vista and almost twice as fast as its predecessor.

The slick look continues at the new GDM login screen with, perhaps, the prettiest background to date. Its darker style may hint at something that was forgotten — for some time in the beta releases, Ubuntu 9.04 had a dark theme as the new default look, but this decision was later reversed, returning to the traditional Ubuntu theme and colours. The darker looks are actually included in 9.04 as optional themes, and some of them fit particularly well with the style of the login screen.

Somewhat taking a break from themed backdrops inline with their development monikers, 9.04 has a simple and



The new timezone selection during install.

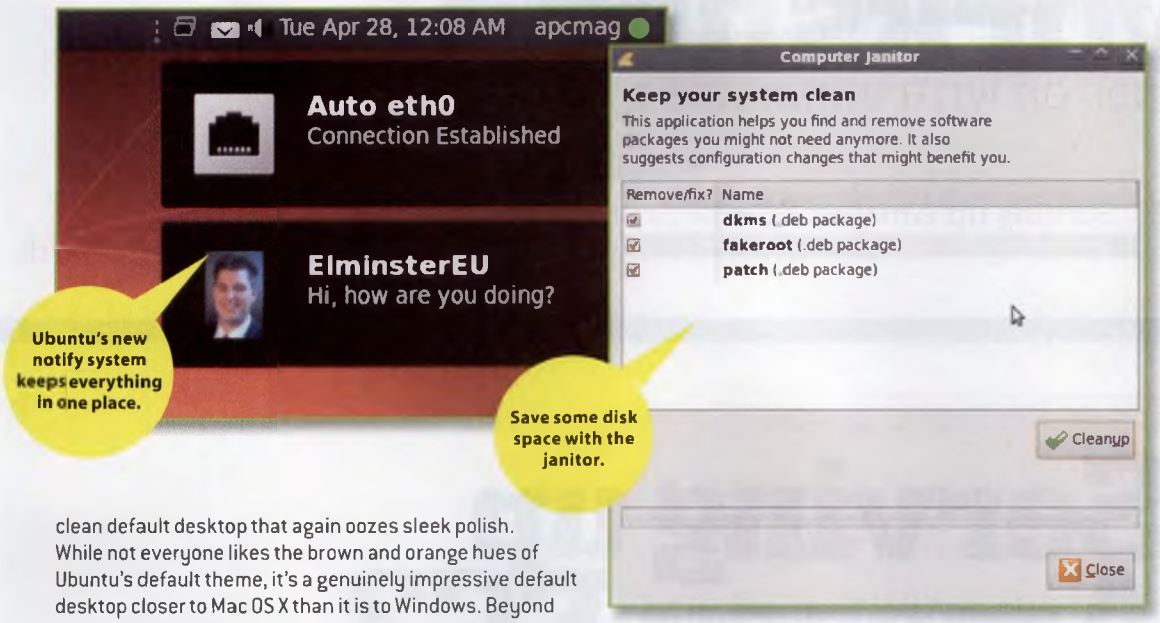


Ubuntu's new visuals tell you you're in for a sleek experience.

APC EXPERT

ASHTON MILLS

Ashton has been using Linux since Slackware came on floppies, and before that he was one of the three people in the world who used OS/2 (and loved it). Always ready to make the most of his PCs, he is constantly playing with Linux distributions and compiling the latest kernel. This is his idea of fun, and why we get him to write for *you*.


Tue Apr 28, 12:08 AM apcmag
Auto eth0
Connection Established
ElminsterEU
Hi, how are you doing?
Ubuntu's new notify system keeps everything in one place.
Computer Janitor
Keep your system clean
This application helps you find and remove software packages you might not need anymore. It also suggests configuration changes that might benefit you.
Remove/fix? Name
dkms (.deb package)
fakeroot (.deb package)
patch (.deb package)
Cleanup
Close
Save some disk space with the janitor.

clean default desktop that again oozes sleek polish. While not everyone likes the brown and orange hues of Ubuntu's default theme, it's a genuinely impressive default desktop closer to Mac OS X than it is to Windows. Beyond this, it's the same Ubuntu desktop as recent releases with a few notable exceptions.

POLISH AND PROGRAMS

As always, applications have been updated and various aspects of the interface have been improved. The most noticeable change in Jaunty, perhaps, is the new notifications system touted by none other than Mark Shuttleworth himself. The idea is to integrate all notifications from the operating system or applications under the same system, providing a consistent experience instead of applications each doing their own thing, something that Windows suffers from as well. The result? While it has its limitations (alters can't be manually dismissed, though they fade to let you select anything underneath them), the result is good — be it Ubuntu telling you you're connected to the network, an email arriving, or a song change in Rhythmbox, they all appear in the same location, font, and themed style. It's one small step to a desktop experience where consistency is pivotal for ease of use. The new GNOME 2.26.1 included in Jaunty brings with it a few nice updates, like the new volume control and Brasero being the new default CD/DVD burning application, something users have been calling for. And OpenOffice 3.0, which narrowly missed being incorporated into Ubuntu 8.10, finds a home in 9.04.

Synaptic inherits a new feature for seeing a screenshot of an application on demand. It's handy, but waiting for it to be fetched from the net means you're unlikely to use it often. A new 'Computer Janitor' program has mysteriously appeared in the 'System > Administration' menu, a precursor for which we saw in 8.10 betas as system cleanup program but was later removed before release. Well, it's finally here in Jaunty but it comes with no documentation and no help button. The first time you run it you have no idea what it can do; only after you've been using your machine a while and installing applications will it show packages it thinks can be removed to free up diskspace. It's no different than running 'sudo apt-get clean' from the command prompt except, well, you don't have to use a command prompt. A good step forward for the GUI junkies.

Even the humble Update Manager gets an extra touch with a 'Settings' button that takes you to the Software Sources dialog, so you don't need to drill down through the main menu for it. About the only change that doesn't make a lot of sense is the moving of Logout/Restart/Shutdown options from the System menu to the Fast User Switch applet, placed in the top right.

On that note, user switching works particularly well — with half a dozen apps loaded and a CD playing, switching to the 'Guest' user as a test instantly presented a clean, fully fledged Ubuntu desktop ready to use. Returning to the apcmag user, entering the password to gain access, not only restored the full desktop that was in use with all programs as they were, but even the CD started playing again and picked up exactly where it left off. Different users can even set different screen resolutions independently, too, and Ubuntu will switch seamlessly between them.

Maybe it's just that new car feel — or more than likely the newer 2.6.28 based kernel — but the general responsiveness seems faster as well. Menu browsing and application loading is quick, and, even when multitasking many programs, feels as if Ubuntu got a turbo change in areas side from bootup in this release.

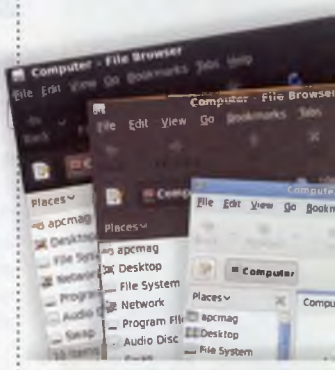
CONCLUSION

As with previous releases the key essentials of Flash, Java and some codecs need to be installed separately but this can be done by selecting the Ubuntu Restricted Extras package from the 'Applications > Add/Remove' dialog or in Synaptic. It's a point-and-click affair, and then your system is ready to go. In fact, bar the selection of Transmission as the default BitTorent client, most of the default programs for Ubuntu are some of the best selections the open source world has to offer, and a default Ubuntu install is far more functional than the same of Windows — and at a price that can't be beat. All up this latest release feels more complete than any version prior, and if there was ever a time to hand an Ubuntu CD to friends or colleagues looking for an escape from Windows, this is it. But that's not to say there isn't room for improvement, and we'll certainly be looking forward to what 9.10 can offer.

MORE ABOUT... TO EXT4 OR NOT

Ext4 is the next iteration of the Ext3 filesystem, and after three years of development it recently made it to the mainline kernel — making it a viable option for distributions to use.

And, indeed, Ubuntu 9.04 is one of the first distributions to bundle it as standard — but not, just yet, as the default filesystem. See this month's Linux Window on page 83 for more about Ext4, and if you should want to use it with Ubuntu 9.04.



MORE ABOUT... THEMES

One area that has seen a few updates are the themes. Largely because of the initial move for a new default theme, there are now a selection of darker Ubuntu moods for you to choose from: DarkRoom, Dust, Dust Sand and New Wave provide a move away from the usual light brown and orange colours to chocolate browns and dark greys. Some of them work particularly well with the two main desktop backgrounds bundled in 9.04. New Wave especially has nice touches like the colour highlights on window buttons when mousing over. I liked this theme so much, some of the screenshots in this instalment are taken with it.

IN THIS ISSUE

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VIRTUALISATION

Serving up Amazon EC2

Simon Bisson shows you how to run servers without hardware using Amazon's Elastic Compute Cluster.

WHAT YOU'LL NEED

AMAZON AWS ACCOUNT
Sign up online for Amazon's cloud computing services.

AMAZON S3 ACCOUNT
Store your data and your machine images on Amazon's infrastructure.

AMAZON EC2 ACCOUNT
Sign up for access to as much computing power as you need.

PUTTY SSH CLIENT
Connect to your EC2 servers from your desktop PC.

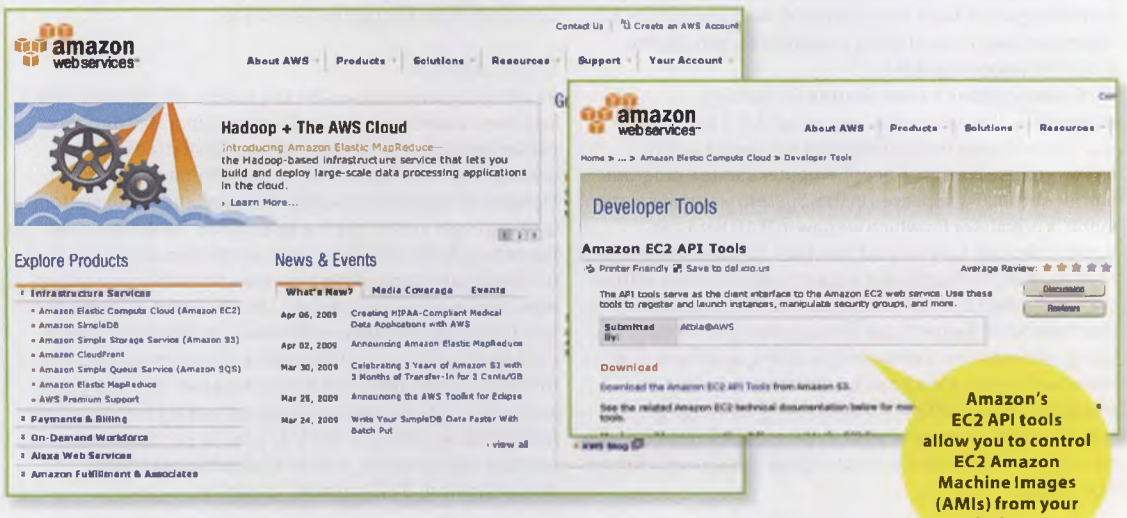
Way back when, in the early days of the web, you didn't need much horsepower to run a web application. Nowadays, things are different. With billions of people online, web applications need to be able to cope with a huge amount of usage. Most of us don't have the capability to build our own massive data centres, so it's very useful to be able to take advantage of someone else's instead.

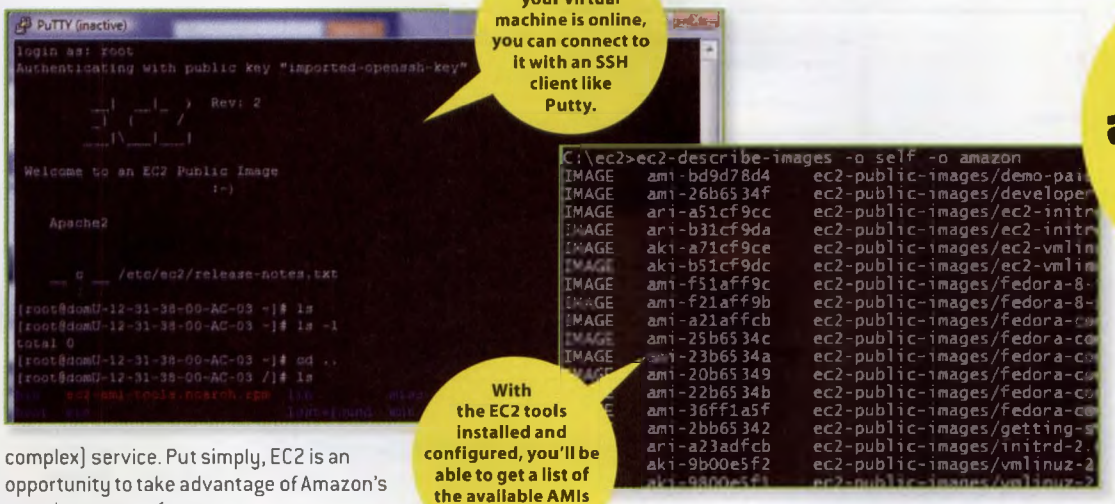
Hosting utilities are nothing new, but the latest services go far beyond giving you a share of a single server or a rack where you can leave your own hardware. Web giants such as Amazon and Google are opening up their hardware and services to the rest of the world. With scalable tariffs charging cents per gigabyte or processor hour, these companies are pioneering what's becoming known as cloud computing.

CLOUD COMPUTING

The internet is often thought of as a cloud. Your PCs connect to it, and somehow, somewhere, your requests are acted upon. You don't need to know how it works: just that it's there. The same is true of cloud computing. If you run an application using Google's App Engine, you don't need to know which server you're using or where your data is; all you need to know is that your application runs properly and your users can connect to the service. Your computer is in the cloud, and it can be anything, anywhere.

Recently we looked at one of the first of these cloud computing services: Amazon's Simple Storage Service (known as S3). That's just one part of Amazon's suite of web services. S3 is simply a storage service. EC2, or the Elastic Compute Cluster, is a very different (and much more




Once your virtual machine is online, you can connect to it with an SSH client like Putty.
With the EC2 tools installed and configured, you'll be able to get a list of the available AMIs from EC2.
C:\ec2>ec2-describe-images -o self -o amazon

Missed a tutorial?

Go to www.imagshop.com.au for back issues of APC

complex) service. Put simply, EC2 is an opportunity to take advantage of Amazon's massive arrays of servers.

Working with EC2 is as easy as running your own virtual servers on your own hardware. You'll need to start with what Amazon calls an Amazon Machine Image (AMI). Each AMI is a virtual server containing your applications, your libraries and your data. You don't need to build an AMI from scratch, as there's an ever-growing library of image templates that can help get you started. Once you've made an image, you'll store it on S3, so you'll need an S3 account before you start using EC2. After you've created and uploaded images, you can use Amazon's EC2 web service to load and manage your AMIs, as well as handling security and network connections. If you need more power, all you need to do is start up another instance of your AMI — there's no configuring servers or buying new hardware. Security is also handled by Amazon, which offers firewall tools to help control connections between virtual servers and protect your AMI instances.

PACKAGE DETAILS

There's more to EC2 than hosting virtual machines. It's also designed to help you keep your web applications online. You can deploy EC2 AMIs across the world using EC2's regions and availability zones. The failure of an AMI instance in one availability zone shouldn't affect one running in another, so your applications and servers will continue to run. You can also use what Amazon is calling 'elastic' IP addresses, which can be quickly moved from one instance to another. The same public IP address can be used for your main AMI instance and then quickly moved to a spare AMI running in another availability zone. There's no need to change DNS settings, and your site will just keep on running.

So how much does it cost? Amazon charges by the instance hour for running servers (so don't forget to close down any unused virtual servers). There are three classes of AMI instance, which compare well to most classes of server currently on the market — small, large and extra large. A small instance is equivalent to a server with 1.7GB of memory, one EC2 Compute Unit (one virtual core with one EC2 Compute Unit), and 160GB of instance storage running as a 32-bit platform. A large instance is a more powerful server and has 7.5GB of memory, four EC2 Compute Units (two virtual cores with two EC2 Compute Units each) and 850GB of instance storage running as a 64-bit platform. You'd probably use a small instance as a web server and a large instance as an application server. For serious horsepower (say for running a hefty database), you'd want to use an extra large instance, which gives you 15GB of memory, eight EC2 Compute Units (four virtual cores with two EC2 Compute Units each) and 1,690GB of instance storage running as a 64-bit platform. Pricing is per instance-hour consumed (and part hours are rounded up) for each instance type, along with additional charges for storage and for data transfers. A small instance costs $0.10, a large instance is $0.40 and an extra large is $0.80. Amazon defines an EC2 compute unit as equivalent to the CPU performance and capacity of a 1GHz or 1.2GHz Opteron or Xeon server.

ADDITIONAL CHARGES

Data transfer rates are similar to S3, starting at $0.10 for all inbound data transfer and going down to the same for outgoing traffic if you're shunting more than 150TB a month. In most cases, you'll be looking at $0.17 per GB, which takes you up to the first 10TB.

If you're transferring data from S3 to EC2, you should find that most transfers are free. Data transferred between AMI instances in the same availability zone is free, but charges come into play when you move data between availability zones. That costs $0.01 per GB in and out of an instance. You can use public and elastic IP addresses to transfer data, but it's better to use EC2's private internal addresses. Public addresses cost money to use, and the free internal transfers are also faster.

Amazon also charges if you're planning on using its reliability functions. If you're using Elastic IP addresses, make sure that they're all in use — if you've reserved one and it isn't in use, it'll cost you $0.01 an hour. Remapping also costs, and if your AMI isn't well designed and often crashes, the costs can add up. The first 100 address remaps a month are free, and additional remaps cost $0.10 each. If you want to save money, make sure that your applications run well!

There's an online calculator, making it easy to work out what you should be paying each month (**http://calculator.s3.amazon aws.com/calc5.html**).

Creating and running an AMI on EC2 is easy. You can start from scratch or pick one from a library of AMIs designed for specific purposes – including web servers and database servers. You can also create your own library of pre-configured AMIs stored in S3. You're initially able to run

DO THIS... CREATE YOUR OWN AMIs

AMIs can be created from scratch, or from existing images. Public AMIs are a good place to start, as they let you add new applications using standard Linux updaters. Once you've built the image you want, upload your private key and certificate to the image using SCP. Using the security tools on the AMI, run the 'ec2-bundle-vol' command on the image, which will build all the files you need.

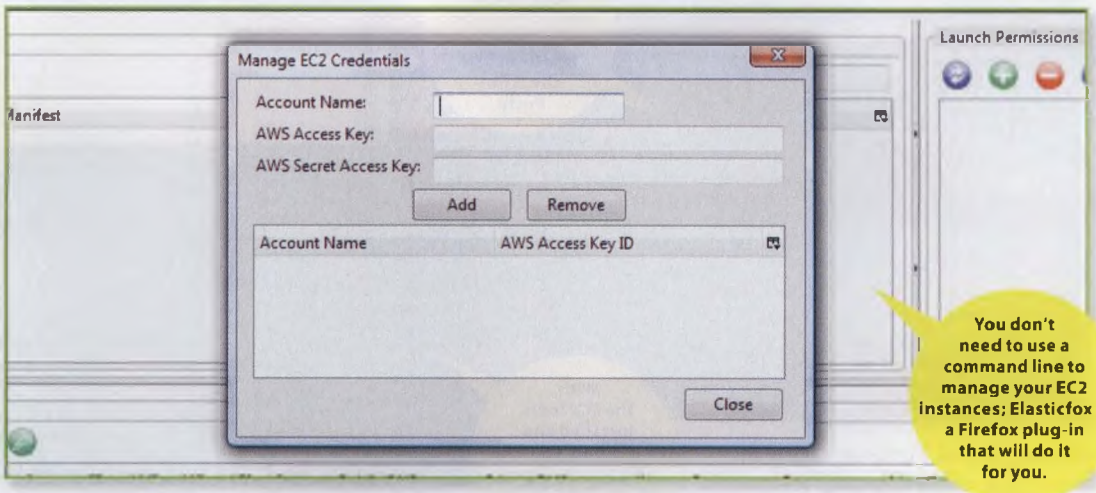
Your new AMI will need to be stored on S3 before you register it with AWS. Once it's been registered you'll have an AMI ID that can be used to launch your image. One option is to build a set of different AMIs, so you have ready-to-run databases, web servers and app servers at hand.

Amazon lets you create new servers from scratch, using what it calls a 'loopback' file. The process is complex and can take time, so it's worth experimenting before you build your first new AMI. You can also create AMIs from existing servers, deploying your physical infrastructure in the cloud.

DO THIS... USE AWS IN A BROWSER

We've focused on Amazon's command line tools, but they're not the only way to work with AWS and EC2. They're online services, so why leave your browser to work with them? One option is Amazon's own Firefox plug-in, Elasticfox. This plug-in gives you one place where you can manage all your EC2 instances. It's best thought of as a graphical dashboard for EC2, where you can see all the details of your running instances as well as managing permissions and handling secure keypairs. The plug-in is still under development, but you should find that it simplifies working with Amazon's services considerably. Amazon also provides a PHP application that you can run on a local web server to help manage your EC2 instances. It's not the most flexible tool, but it's worth considering if you've got a limited number of images that you want to run.

If you're planning on building a business using EC2, you will probably want to use commercial tools like RightScale. RightScale isn't cheap, but it adds a lot to EC2 and makes it a lot easier to use EC2's useful reliability and scalability features.


Manage EC2 Credentials
Account Name:
AWS Access Key:
AWS Secret Access Key:
Add
Remove
Account Name
AWS Access Key ID
Close
Launch Permissions
You don't need to use a command line to manage your EC2 instances; Elasticfox is a Firefox plug-in that will do it for you.

up to 20 instances and use up to five elastic IP addresses — if you need more, you can use an online form to ask for resource increases. Once an AMI is running, you'll be charged on an hourly basis until it's shut down.

There's no user interface for a running AMI (unless you're using one as a web server), so you'll need an SSH client. Windows users can download the excellent (and free) Putty, which can be found at: **http://tinyurl.com/p2r**.

SET UP YOUR SERVER

First, sign up for an AWS account (**http://aws.amazon.com**). You'll need an S3 account before you can sign up for EC2. Don't forget to write down your AWS Access Key ID and your secret Access Key, as well as downloading an X.509 security certificate. You'll also need your AWS account ID. This, without the hyphens, is your EC2 user ID.

Once you've received and recorded all of this information, you need to download the EC2 command line tools from the EC2 resource centre. These are written in Java, and have shell scripts for most common operating systems. Download the zip file and extract it to a directory on your PC. You'll need to set an environment variable to point to the tools directory:

```
C:\> set EC2_HOME=<path-to-tools>
```

You'll also need to add the tools bin directory to the system path:

```
C:\> set PATH=%PATH%;%EC2_ HOME%\bin
```

Once you've done that, you need to set up environment variables that point to the X.509 private key and certificate that you generated when you signed up for Amazon Web Services and EC2. 'EC2_PRIVATE_KEY' points to your private key and 'EC2_CERT' points to your X.509 certificate:

```
C:\> set EC2_PRIVATE_KEY=path_ to_key\keyfile
C:\> set EC2_CERT=path_to_cert\ certificatefile
```

You'll also need to make sure that you've set 'JAVA_HOME' to point to your Java Runtime. If you're planning on using EC2 regularly, use Windows' Advanced System Settings to make sure that your environment variables persist from command line window to command line window.

You can now connect to Amazon and request a list of the available AMIs that you are able to use as your cloud computing machines. To do this, use the 'ec2-describe-images' command:

```
ec2-describe-images -o self -o amazon
```

After running the command, you'll be presented with a list of available images along with their AMI IDs. These ID codes allow you to access images and load images onto EC2. Once you've chosen an AMI, you have to create the public/private key pairs that you need to log in to your image. Public images don't have a password, so you'll need this for secure access using an SSH client like Putty. Use this command:

```
ec2-add-keypair gsg-keypair
```

Cut and paste the resulting key into a notepad file and save it. If you're using Putty, you'll also need to use PuttyGen to convert the key into Putty's own key format.

We're now ready to run our first EC2 AMI instance. All we need to do is type:

```
ec2-run-instances [instance ID] -k gsg-keypair
```

You'll be presented with a list detailing the settings for the image you've launched. Make sure that you note the instance ID, as you'll need this to query the instance and to terminate it when you've finished using the service. Use the instance ID with the 'ec2-describe-instances' command to show the external DNS name of the machine you've just launched, along with the internal DNS name that you can use to contact your machine from another EC2 instance.

Once your machine is up and running, you'll need to adjust the EC2 firewall to give you access:

```
ec2-authorize default -p 80
```

This command opens up port 80, and you can also allow SSH access by opening up port 22. You should be able to test your AMI machine by connecting to the external DNS name with a web browser.

Once your EC2 server is up and running, you can use it just like any other server — whether that's for running applications, hosting web sites or powering a database. SSH gives you secure access to the server, allowing you to configure it just the way you want. Unwanted instances can be terminated, using the 'ec2-terminate-instances' command.

SILVERLIGHT

Create a package

Enhance last month's game with a custom install experience, audio and more. **Richard Costal** shows you how.

WHAT YOU'LL NEED

MICROSOFT VISUAL STUDIO WEB DEVELOPER (SP1)
Download it for free from the Microsoft web site: *www.microsoft.com/express/vwd*

MICROSOFT SILVERLIGHT TOOLS
This add-on includes the Silverlight SDK and the Silverlight Developer Runtime. Download it from *www.microsoft.com/silverlight/resources/tools.aspx*

EXPRESSION BLEND 2 SP1 (OPTIONAL)
Allows use of Silverlight 2 design features such as font embedding.

Last month we took you through the steps involved in building a game using Silverlight 2. We covered how Silverlight gives you flexible layouts through the Canvas and Grid container controls, can perform simple animations with storyboards and uses data binding to connect an object or data value to a user interface element. In this article, we're going to explore some more specific features of Silverlight and implement them into our BlockSquash game.

The first time that a user visits a site that contains Silverlight content, they'll be prompted to install the Silverlight plug-in. This is fine, but we want to give our users a more compelling reason to install Silverlight and play the game. Our BlockSquash solution contains two types of page, both of which can host the Silverlight game: an ASP.NET page and a flat HTML page. We're going to update them both with a new install interface.

The Silverlight plug-in is instantiated by the 'Object' tag in the HTML page. If the browser can match the object type to a plug-in when parsing the page, the control will be activated and rendered. If Silverlight is not installed, the browser will instead look for the next valid content. It will ignore all of the <param> elements and render the at the bottom of the following code extract. This section is where we put our custom HTML that tells the user that they need to install Silverlight if they want to play BlockSquash:

```
<object
data="data:application/xsilverlight-2,"
type="application/x-silverlight-2"
width="100%" height="100%">
<param name="source"
value="ClientBin/BlockSquash. xap"/>
[...]
<param name="autoUpgrade" value="true" />
<div style="position:absolute; width:750; height:595;
background-color:#3F5AB6; colour:White; text-align:
center;>
<a href="http://go.microsoft.com/fwlink/?LinkID=124807"
style="text-decoration: none;">
<img src="Assets/InstallBlockSquash.jpg" alt="Get
Microsoft Silverlight to play BlockSquash" style="border-
style: none"/>
</a>
</div>
</object>
```

Now let's look at the ASP.NET page, the HTML that contains a server control used to embed Silverlight. The 'ASP:Silverlight' control is actually a wrapper for the Object tag shown in our previous example. We can copy our HTML code into the server control by using the 'PlugInNotInstalled' element inside the ASP:Silverlight control:

```
<asp:Silverlight ID="Xaml1" runat="server"
Source="~/ClientBin/BlockSquash. xap"
MinimumVersion="2.0.31005.0"
Width="100%" Height="100%">
<PluginNotInstalledTemplate>
<div style="position:absolute; width:750; height:595;
background-color:#3F5AB6; colour:White;text-align:
center;">
<a href="http://go.microsoft.com/fwlink/?LinkID=124807"
style="text-decoration: none;">
<img src="Assets/InstallBlockSquash.jpg" alt="Get
Microsoft Silverlight to play BlockSquash" style="border-
style: none"/>
</a>
</div>
</PluginNotInstalledTemplate>
</asp:Silverlight>
```

Of course, if you have already downloaded Silverlight then you will not see this dialog. To test if things work, we need to turn it off temporarily. In Internet Explorer, go to 'Tools > Manage Add-ons > Enable and Disable Add-ons'. From here you can enable or disable the Silverlight plug-in.

INSTALLER PROGRESS

Following installation, you're shown a standard loading splash screen, which we can further enhance by changing its layout. We can use raw Silverlight to do this instead of HTML. Our BlockSquash application is downloaded from the server as an '.xap' file as part of the installation process, which raises an interesting question: how are we supposed to alter Silverlight rendering when our app hasn't downloaded yet? Well, we add an XAML page outside the deployment package, which the Silverlight plug-in will interpret.

First, we use Visual Studio to add a new Silverlight JScript page, 'BlockSquashLoader', to the web application (and not our Silverlight application). This action will create an XAML file and a JavaScript file for the code behind.

We then need to reference this in our ASP.NET and HTML pages, first by adding the Script file to the head section of the page, and then by referencing the splash screen page in the appropriate Silverlight controls:

```
<script type="text/javascript" src="BlockSquashLoader.
js"></ script>
```

MORE ABOUT... SILVERLIGHT MOBILE

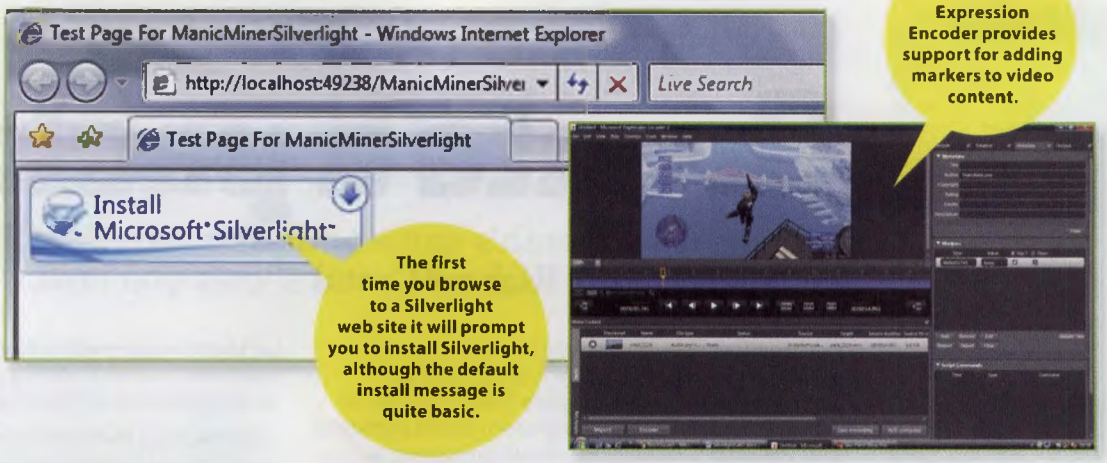
Microsoft is currently working on a mobile version of Silverlight. Windows Mobile and Nokia S60 devices will be the first to benefit from the new plug-in, which will be based on Silverlight 2. You'll be able to use the same tools to build web and mobile Silverlight applications. Silverlight for Mobile should appear in 2009.

SILVERLIGHT INSTALL

One important thing to remember is that you do not need to have the Microsoft .NET framework installed on your machine in order to run Silverlight. The Silverlight 2 install is a self-contained one-time 4.5MB download that can be downloaded and installed in around 10 seconds on a typical machine. It runs on both PCs and Macs and supports all major browsers.

USING TOOLTIPS

Tooltips are an important way to give unobtrusive help to the user. They can be added to just about any control in Silverlight by using the 'ToolTipService. ToolTip' control. Like every other XAML control, you can completely override the visual appearance of the tooltip. We've implemented a basic tooltip in the BlockSquash game to show you how many blocks are removed when you move the mouse over a block.


Test Page For ManicMinerSilverlight - Windows Internet Explorer
http://localhost:49238/ManicMinerSilver
Live Search
Test Page For ManicMinerSilverlight
Install Microsoft Silverlight
The first time you browse to a Silverlight web site it will prompt you to install Silverlight, although the default install message is quite basic.
Microsoft's Expression Encoder provides support for adding markers to video content.

In the ASP.NET page, add the 'OnPlugInSourceDownload ProgressChanged' and 'Splash ScreenSource' parameters:

```
<asp:Silverlight ID="Xaml1" runat="server"
Source="~/ClientBin/BlockSquash.xap"
MinimumVersion="2.0.31005.0"
Width="100%" Height="100%"
OnPluginSourceDownload ProgressChanged="onSource D
ownloadProgressChanged"
SplashScreenSource="~/ BlockSquashLoader.xaml">
```

In the HTML page, we need to add the 'OnSource Download ProgressChanged' and 'Splash ScreenSource' Param elements to the Object tag:

```
<param name="splashscreensource"
value="BlockSquashLoader.xaml" />
<param name="onSourceDownloa dProgressChanged"
value="onObjSourceDownloadProgressChanged" />
```

We now need to catch the progress percentage — raised from the 'ProgressChanged' event — and update our new custom splash screen. You may have noticed that the parameter name is subtly different for the ProgressChanged event handler: this is because they use different methods to access the element within the XAML. The code shown below has comments which highlight each type. For the progress display percentage, we multiply the value passed in by 100 as the progress call returns a floating point number between 0 and 1. To start with, here's the ASP Silverlight version:

```
function onSourceDownloadProgre ssChanged(sender,
eventArgs) {
var XamlHost = document. getElementById("Xaml1");
var TextBlock = XamlHost.content. FindName("tblLoader");
var ScaleXForm = XamlHost. content.FindName("PrgBar");
TextBlock.Text = Math. round(eventArgs.get_progress() *
100) + "%";
ScaleXForm.ScaleX = eventArgs. get_progress();
}
```

And, for completeness, here's the HTML Object version:

```
function onObjSourceDownload ProgressChanged(sender,
eventArgs) {
sender.findName("tblLoader").Text = Math.
round((eventArgs.progress * 100)) + "%";
sender.findName("PrgBar").ScaleX = eventArgs.progress;
}
```

The 'ScaleXform' object in our Loader XAML is a rectangle with its 'ScaleX' property set to 0. By increasing the ScaleX value from 0 to 1 (normal size), we have created ourselves a status bar by the end of the download:

```
<Rectangle Fill="#FF2033B3" Canvas.Left="321.548"
Canvas.Top="351.343" Width="91" Height="17" RenderTr
ansformOrigin="0.0,0.0"> <Rectangle.RenderTransform>
<ScaleTransform x:Name="PrgBar" ScaleX="0"
ScaleY="1"/> </Rectangle.RenderTransform>
</Rectangle>
```

Irritatingly, the BlockSquash XAP install weighs in at a miniscule 65KB; hardly very challenging for our downloader. We can test that our splash screen is working by adding a video to the Assets directory and setting its Build action to 'Resource'. Reload and you'll get the full experience, but remember to remove the file before you deploy the application online.

I CAN'T HEAR YOU

It's time to add some sound effects to the game. Silverlight uses a MediaElement tag that supports both video and audio files, including MP3 and WMA. You need to choose whether the audio files are downloaded at runtime from a web server or embedded directly into the XAP file. Our application only uses three small audio files, so they're better off embedded into the XAP. Add an Assets directory to the Silverlight application, drop the MP3s into that directory and set their Build action to Resource.

We now need to add a MediaElement tag to our 'Page. XAML' file. We'll give this control the name 'meAudio' so that it can be accessed in code. We'll also put in some support for the user to adjust the volume of the audio:

```
<MediaElement x:Name="meAudio" Volume="{Binding
Volume}" IsMuted="{Binding IsMuted}"/>
```

The 'Volume' and 'IsMuted' properties are bound using the data context that we discussed last issue. Our BlockManager class exposes properties for each of the

The custom application install screen makes the application loading a part of the attraction.

above and notifies the underlying framework whenever its value is changed:

```
public bool IsMuted
{
get { return m_IsMuted; }
set
{
m_IsMuted = value;
PropertyValueChanged("IsMuted");
}
}
```

We can then create the 'Check Box' and 'Slider' controls for the volume. Notice how the slider has a 'TwoWay' data binding mode on the volume. When the slider is adjusted, the changes will be reflected first in the Block Manager class and then onto the MediaElement:

```
<CheckBox Foreground="White" Content="Mute"
Click="cbxMute_Click"
x:Name="cbxMute"
IsChecked="{Binding IsMuted, Mode=TwoWay}"/>
<Slider Minimum="0" Maximum="1" Width="50"
x:Name="sldVolume" Value="{Binding Volume,
Mode=TwoWay}"/>
```

The last piece of the puzzle allows the BlockManager class to tell us when it wants us to play the audio file — in our case, when a block is removed from the array:

```
if (OnAudioEvent != null) OnAudioEvent(AudioEvent.
BlockRemoved);
```

Our game listens for the event and uses a switch statement to call a private method called 'PlayAudio', passing in the relevant filename:

```
case AudioEvent.BlockRemoved: playAudio("Assets/
BlockRemove. mp3");
break;
```

The PlayAudio method will stop any audio that's already playing and resolve the URI of the source. This can be an absolute URL that points to a web server or, as in our case, a resource:

```
void playAudio(String AudioFile)
{
meAudio.Stop();
meAudio.SetValue(MediaElement. SourceProperty, new
Uri(AudioFile, UriKind.Relative));
meAudio.Play();
}
```

Finally, it's time to add a bit of persistence: we'll restore the player's high score each time that the game is restarted so that all their hard work is remembered.

SAVING YOUR HIGH SCORE

Silverlight supports a feature called Isolated Storage, which uses a predefined location to save files and data. Isolated Storage is extremely flexible. You're not just limited to one file; you can create as many layers of folders and files as you need. In our game we'll only use the Isolated Storage to hold our high score, with the 'ApplicationSettings' class handling all the file work for us:

```
private void GetHighScore()
{
var m_AppSettings = IsolatedStorageSettings.
ApplicationSettings;
if (m_AppSettings. Contains(HIGHSCORE_ APPSETTING))
{
int.TryParse(m_AppSettings[HIGHSCORE_ APPSETTING].
ToString(), out m_HighScore);
}
}
private void SaveHighScore()
{
var m_AppSettings = IsolatedStorageSettings.
ApplicationSettings;
if (m_AppSettings. Contains(HIGHSCORE_ APPSETTING))
{
m_AppSettings[HIGHSCORE_ APPSETTING] = m_HighScore.
ToString();
}
else
{
m_AppSettings.Add(HIGHSCORE_ APPSETTING, m_
HighScore. ToString());
}
m_AppSettings.Save();
}
```

The code snippet above will look for an entry with the matching key and load it from the app's settings. When the user gets a new high score, the 'SaveHigh Score' function is called. This function updates or creates the data within Isolated Storage for use by the game.

MORE ABOUT... SMART SERVICES

Why not get really adventurous with your high score saving routine? You could utilise ASP.NET Application Services, which ship with ASP.NET as a part of the provider model. They provide out-of-the-box authentication, role and profile functionality without the need to write a single line of code. They also contain controls for login, registration and even forgotten passwords, all of which can be totally customised. The Provider Model also gives us the ability to apply authentication and role security access against each page and folder in an ASP. NET application. Application Services provides a subset of these services for consumption by AJAX clients, Smart Client and Silverlight apps via Windows Communication Foundation (WCF) services. You can expose the services in the web site's configuration page. It's even possible to configure it to only expose certain properties of the user's profile and determine if they are to be read-only or not. Our Silverlight app could then call these services to authenticate the user on startup and read their high score. The benefit of this over Isolated Storage is that the data is held centrally, meaning that we can implement leaderboards so that the client can see their high scores on any machine.

CLOUD COMPUTING

Back up your drives to the web

Online storage gives you access to your files from anywhere with an internet connection, **Karl Hodge** explains.

WHAT YOU'LL NEED

SYNCPLICITY
Our choice of the third-party storage applications. Download it from *www.syncplicity.com*

WINDOWS LIVE SYNC
Enables the storage and synchronisation of your files. Find out more at *http://sync.live.com*

FTP STORAGE SPACE
You'll need to have access to private storage space on a remote server.

Sometimes computers crash so spectacularly that the only way to get your machine breathing again is to completely reinstall the operating system. But what happens to your data? Your precious personal documents and digital pictures? Your carefully crafted list of internet favourites? The family accounts? The answer, of course, is that those particular copies are lost. But the solution is easy: don't keep your data stored locally. It's easy to back things up securely online, keeping your data safe even if your computer crashes and burns. Here we explore a hassle-free way of backing up data to an online repository.

ORGANISE YOUR FILES

1 We'll start by assuming that all of your important documents, media and pictures are in your My Documents folder. If they're not, put them there now. Next, go to the Start menu and choose 'Search'. We're going to hunt down and remove the junk you don't need. Click 'All Files and Folders' and then select the 'My Documents' folder from the 'Look In' dropdown menu. The aim is to remove waste — so start with the search term '*.tmp' and click 'Search'. You can find other temporary files by searching for the '~' symbol (it's called a 'tilde'). Select all of the files that are returned by hitting Ctrl+A, then hit Shift+Delete to erase them. You can search for and delete other unwanted file types in the same way. To finish off, use a freeware disk-cleanup program like CCleaner to track down and erase any lingering unwanted temporary data.

FIND A LOCATION

2 Next, you need to configure the backup location. For this you'll need to have some FTP storage space on a remote server. Many internet connection accounts come with free web space as part of the package, and that should be fine to use, but check that there's enough space for your data first. If you don't have any FTP space, try signing up for a free service, like that found at **www.drivehq.com**. Remember, though, that if your host goes down, so does your backup. It pays to pay sometimes.

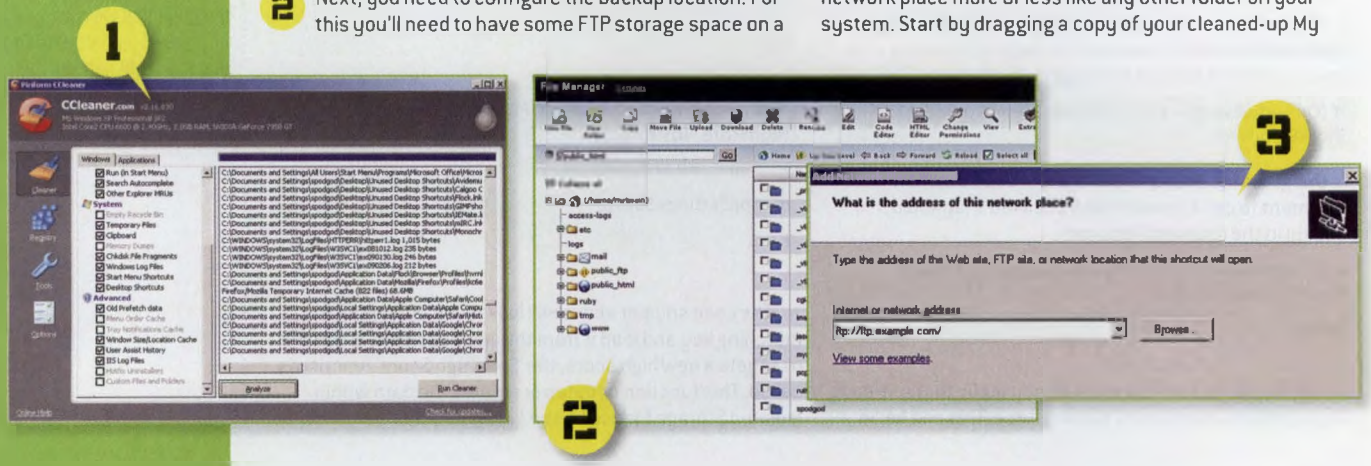
You'll need to know the FTP address of your storage space as well as your user ID and password. If you don't know these details, check the help documentation on the web site of your web host or ISP.

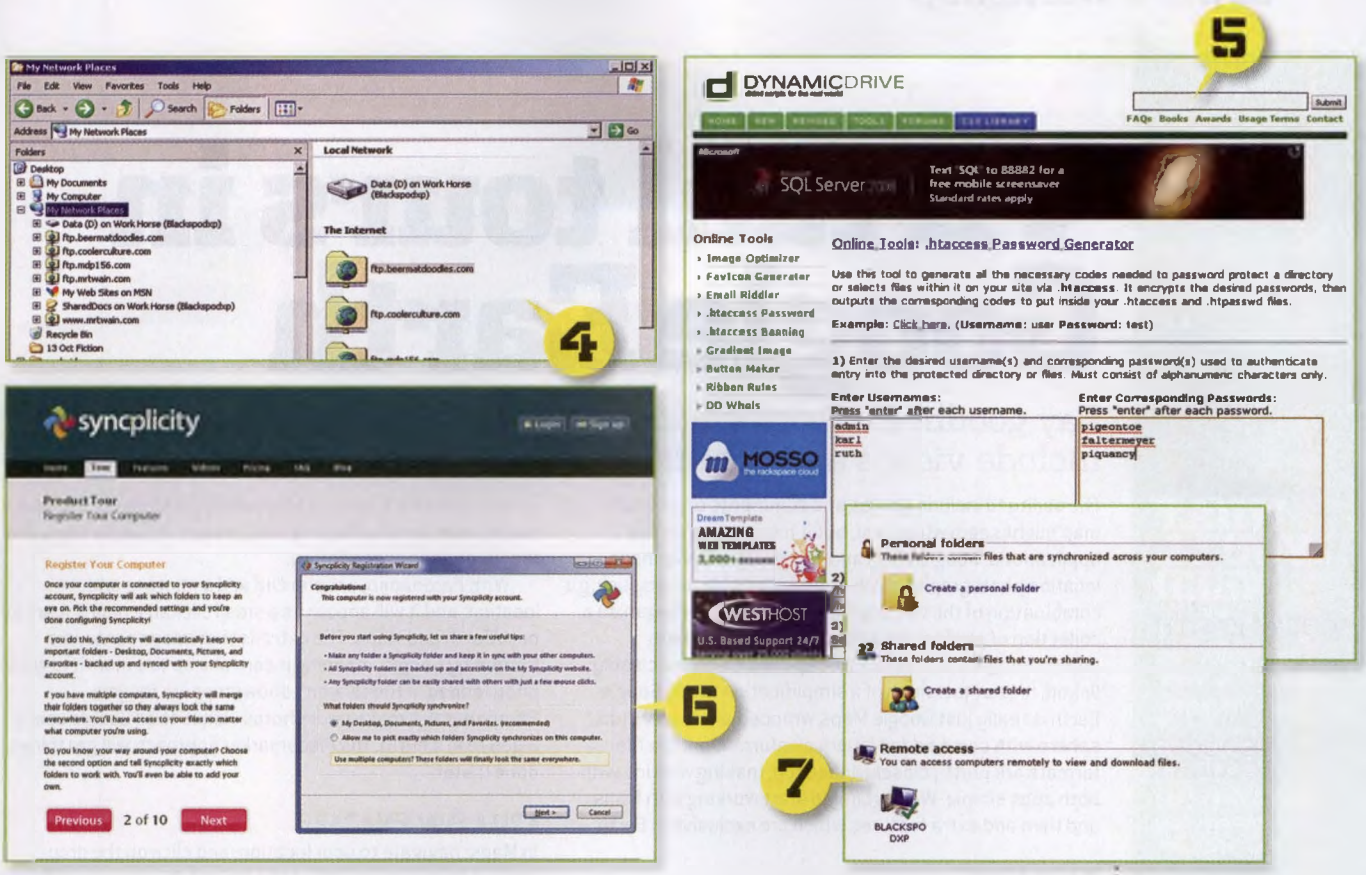
CREATE A NETWORK PLACE

3 Open the Start menu and choose 'My Network Places'. Click 'Add a Network Place'. In the Wizard that appears, click 'Next' and then select 'Choose another network location. Specify the address of a web site, network location or FTP site.' Click 'Next' and enter the full address of the site that you wish to access as an FTP URL. Click 'Next' and untick the box labelled 'Log on anonymously'. Enter your FTP username in the box. Finally, you'll be prompted to give a name for the connection. Make sure that the box labelled 'Open this network place when I click finish' is ticked, then click 'Finish'.

STORE FILES ONLINE

4 The first time that you connect to your new network place, you'll be prompted for your FTP password. Type it in and tick the box labelled 'Save Password' in the Log On As dialog before clicking 'OK'. In future you can treat this network place more or less like any other folder on your system. Start by dragging a copy of your cleaned-up My


1
2
3
What is the address of this network place?
Type the address of the Web site, FTP site, or network location that this shortcut will open.
Internet or network address:
ftp://ftp.example.com/
Browse...
View some examples.



Documents folder to the new online storage link. In future, you can quickly add new documents directly to the network place you've just created and retrieve them from there too.

IMPROVE SECURITY

5 One problem with the method described above is that it can make your documents vulnerable to access via HTTP. There are a few ways to enhance security, though. If possible, place files in a section of storage space that's only accessible via FTP. If that's not possible, put files in folders with names that are hard to guess — a string of letters and numbers — and make sure that the root folder contains an 'index.html' file so that snoopers can't browse the directory. You could also use an '.htaccess' file to password-protect a personal folder from potential snoopers. You'll find an online tool that'll help you generate the required files at **www.tools.dynamicdrive.com/password**. It should go without saying that sensitive data shouldn't be put online, even in a password-locked folder. You're better off using an encrypted USB stick to back up really important files.

USING SYNCPLICITY

6 We've tried several online storage options, and our current favourite for both ease of use and price is relative newcomer Syncplicity. With Mac, Linux and Windows versions available, you can synchronise and share up to 2GB of data online from two machines for free, while paying $10 a month buys you 50GB of space and usage on any machine. You can sign up for and install the software direct from **www.syncplicity.com**, then right-click on the folders that you want to back up to Syncplicity's cloud-hosted storage. The first backup takes a while, but after that the program updates your folders in the background. It's transparent and easy, and as long as you have an internet connection you can access your files anywhere. You set the privacy level of the stored files, sharing them with others if you like. Files can be transferred with 128-bit encryption — so your secrets are safe with Syncplicity.

WINDOWS LIVE SYNC

7 Microsoft's Live suite of tools offers several storage and synchronisation options, including Windows SkyDrive (**www.skydrive.live.com**), a file storage and sharing system with 25GB of free space. This is perfectly decent, but we like the simplicity and approach of Windows Live Sync. Rather than uploading your files to a server, Live Sync gives you access to documents stored on your local internet-connected machine from the web, using a client-side application installed on your machine. You enable remote access by right-clicking on the application's task bar icon and choosing 'More', then 'Settings'. You can then browse and grab files from the local machine at **http://sync.live.com**. The only thing you'll need is your Windows Live ID to log in. You can also configure the system to synchronise folders across computers with Windows Live Sync software installed. Up to 20 folders can be synchronised, each containing a maximum of 20,000 files apiece.

Another handy feature is that you can share folders on your machine with family, colleagues and friends. Just click the 'Create a shared folder' link at the Windows Live Sync site and browse to the directory holding the files that you want to synchronise with others.

DO THIS... ADD NETWORK LOCATIONS

Looking for Network Places in Windows Vista? You won't find it because, annoyingly, it isn't there. You can still add direct connections to FTP servers, though: just use the Map Network Drive dialog instead.

Open 'Computer' in the Start menu – or hit Windows+E to launch Explorer – then press Alt to bring up the classic file menu. Click on 'Tool > Map Network Drive'. In the dialog that appears, click the link titled 'Connect to a website that you can use to store your documents and pictures'. A step-by-step wizard will appear. Follow the instructions and type your FTP space address with the syntax in the form 'ftp://ftp.example.com', specifying a username and password when prompted. Once this is done, the FTP site will henceforth appear as a network location in Windows Explorer.

INTERNET

Virtual tours in Google Earth

Say goodbye to boring photo slideshows with virtual tours that include videos and commentary, says **Richard Wentk.**

WHAT YOU'LL NEED

GOOGLE EARTH
Both version 4 and version 5 will be fine for this project.

A GOOGLE ACCOUNT
You'll need a Google account to use both Maps and Earth.

PERSONAL WEB SPACE
Some web space is needed for uploading photos to add to your tour. A Paronamio account is perfect.

A MICROPHONE
You'll need this if you want to record commentary for your video.

The ability to include photos and comments on a virtual map might seem whimsical, but it has some practical applications. Google Maps and Google Earth have made location photography much more accessible, and by using a combination of the two applications it's easy to organise a collection of photos into a presentation that's both entertaining and informative. Maps and Earth are closely linked; it's not too much of a simplification to say Google Earth is really just Google Maps wrapped around a virtual sphere with some added layers of information. The file formats are pretty closely linked too, making working with both apps simple. We're going to start working with Maps and then add extra features which are exclusive to Earth.

MAKE A MAP

To start the process, you'll need a Google account. Once you're logged in, click on 'Maps' and then 'My Maps'. Select 'Create New Map' and give it a name and description. To start adding details, click on the 'Edit' button. You'll see some new icons appear at the top left of the Map window. From left to right, these are the Drag tool, the Placemarker dropper, the Path marker and the Area marker. Clicking on 'Drag' returns Maps to the usual drag-and-zoom mode. The other tools are used to add information to the current map.

ADD SOME PHOTOS

There are three ways to add photos and markers. If you want to produce a version of your map for the web, the best two options are the Placemarker system in Google Maps and the Paronamio photo library.

With Paronamio, anyone can add a photo to any location, and it will appear as a small clickable blue square in both Earth and Maps. The catch is that image content is filtered by Google, meaning it can take up to a month to get a photo added. If these aren't showstoppers for you, Paronamio will make your photos visible to all Google users. If you're in a hurry, the Placemarker approach will get things done faster.

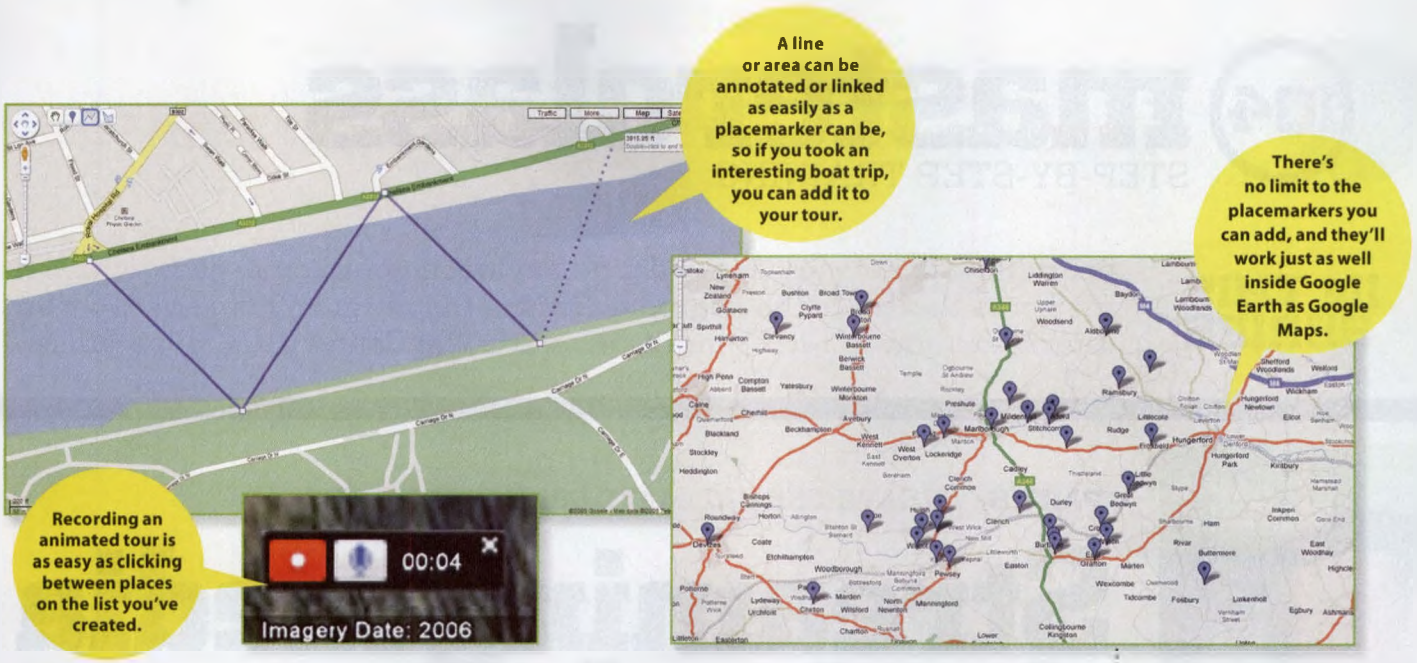
ADD A PLACEMARKER

In Maps, navigate to your location, and click on the drop-shaped Placemarker icon at the top left. Your mouse will turn into a floating copy of the icon. Drop it at the location on the map you want to highlight, and then drag it for fine-tuning. Once done, you'll see a dialog box appear for the marker. If you left-click on the icon at the top right, you can choose one of the other marker shapes.

Fill in the Title box with a useful name and then click on 'Edit HTML'. To add a photo here, type in a standard HTML '<img>' link. If you want to add bigger photos, you'll have to design your own placemarker balloons — see the 'Pin slideshows and video' sidebar for some hints. Note that you can also add areas and trails using the other edit icons. An obvious application is creating driving directions — paint on

Superimposing your photos onto the 3D buildings featured on Google Earth can be a cool effect if you have the time needed to fine-tune things.

Adding content to a placemarker is easy: just type in a link.


A line or area can be annotated or linked as easily as a placemarker can be, so if you took an interesting boat trip, you can add it to your tour.
There's no limit to the placemarkers you can add, and they'll work just as well inside Google Earth as Google Maps.
Recording an animated tour is as easy as clicking between places on the list you've created.
00:04
Imagery Date: 2006

the lines or areas you want to highlight and they'll be added to your map.

SHARE YOUR MAP

When you've added your photos, placemarkers and other features, you can save the entire list as a map and embed it in a web page to create a static clickable tour, complete with placemarkers that anyone can view. At the top right of the Maps page, click on 'Link'. It's a good idea to customise the size of your preview, so click on 'Customise and preview embedded map' and experiment with the straightforward options there. When you're done, copy and paste the HTML into a web editor, add whatever notes, headers and other details you want around it and upload it to a web page. You can also export your map to Google Earth. To do this, ensure you're in Edit mode and click on the 'View in Google Earth' link at the top right. Your browser may be set up to load the file directly into Google Earth; alternatively, you can save it to disk for sharing by email or as a download.

ADD OVERLAYS IN EARTH

Google Earth has a feature called Photo Overlays, which lets you add a levitating photo to any Earth location. Overlays look good, but they're a little tricky to use. They're a good option for more decorative and less functional tours, as although you can use any size of photo, you can't include links and text as you can with placemarkers. To get round this, you can overlay photos on top of an existing placemarker that includes links and information.

To add a photo, load Google Earth, navigate to your photo's location and — this is important — use the middle mouse button to set up a horizontal rather than a top-down view. Click on 'Add > Photo' in the top menu. If your photo is on your hard disk, use 'Browse' to find it. If it's online, type in the URL in the Link line.

Overlays have some quirks that you need to know about. First, photos are only visible from one side of a given target. You can see the Overlay icon — it looks like a camera — from any side, but the photo is only visible when the viewer is looking at it along the same plane as the image. The Tilt option angles the photo; use a setting of 90° to give you a ground-friendly view floating in space above your location.

Second, it's worth keeping in mind that while loading high-res photos online will take a long time, low-res JPEGs will look rough. Embedding higher-quality photos is definitely the way to go. You should also know that your overlay photos aren't visible to other users of Google Earth. To share them you'll have to save your tour into a file that's available for other users to open.

MAKE A TOUR

When you've dotted a few photos around Google Earth, you can join them together to create a video fly-through. Creating a photo overlay adds it to Earth's list of locations in the left sidebar. To record a tour, select 'Add > Tour', hit the 'Record' button and double-click on each location in turn. The view will move between photos, panning in and out automatically to match the default pan, tilt, height (and so on) that you've defined for each photo. You can also click on Paronamio photos to open and close them. Unfortunately, placemarkers can't be opened to show any photos that you've linked into them. However, if you double-click on a placemarker, the view will pan smoothly to a top-down aspect with the placemarker at the centre. You can, of course, move the view manually too.

To add a narration, just plug in a microphone and start talking. Unfortunately, there's no easy to way to save a completed tour as a video file, but if you have screen capture software such as Fraps, or a capture plug-in for your browser, you can grab the sequence indirectly and then add audio and music in a video editor.

SHARE YOUR TOUR

To finish things off, save your tour as a file. Right-click on the tour in Earth, and select 'Save Place As...'. This creates a KMZ file that you can email to other people or upload to a web site. When a Google Earth user double-clicks on this, Earth will load and the tour will start running.

A KMZ file is a packaged zip file that includes an editable KML file of XML data. If you rename the KMZ file and unzip it, you'll be able to open the movement commands for your tour in a text editor and edit the code by hand. The syntax is straightforward enough to make editing very easy, so you can control exactly how your tour moves around the various points of interest. APC

DO THIS... PIN SLIDESHOWS AND VIDEO

You can pin more than photos to placemarkers; you can also add videos and slideshows. To link to a YouTube video instead of a photo, just copy and paste the 'embed' text. If you do this, you can upload your edited video tour to YouTube and then create a 'Click here to play' placemarker at the geographical start of the tour. Other possibilities include linking to a Google presentation or a Picasa slideshow. You can also design your own placemarker balloons: see *www.tinyurl.com/d9tskv* for an easy-to-follow tutorial. Another option is to add information to a line or shape rather than a placemarker. To do so, draw out an area using the Shape tool and then add the information in the usual way.

IN THIS SERIES

Learn how to network every digital device in your home, everywhere from the home theatre to the bedroom. This is the ultimate home-networking tutorial on how to turn your castle into a 21st-Century digital paradise.

THE CONNECTED GUY

David Neiger will be building the connected house in a real home and will be filing regular columns and updating the *APC* web site as he goes along. David is a qualified engineer with many years of networking, IT implementation, consulting and project management experience.

WHAT'S NEXT?

PART 7
JULY '09
BUILD A HOME THEATRE PC

PART 6 CREATE THE ULTIMATE CONNECTED HOME

Streaming media the Apple way

There are many ways to stream music and video around the house. This month, we're using Apple gear.

Several proprietary standards are available for streaming digital content around the house. Various electronics manufacturers, including LG, Panasonic and Sony, use the DLNA (Digital Living Network Alliance) standard, which is not tied to any specific content provider. Microsoft has Windows Media, which works with Windows PCs, Microsoft Xbox and other Windows Media certified devices. Apple uses its iTunes standard, which is linked to the Apple iTunes store.

More general standards, like The UPnP (universal plug and play) protocol is used mainly for computers but works with several hardware devices such as the Popcorn Hour streaming media device, Xbox and PlayStation 3. There are also numerous internet protocols for streaming media such as DivX, Flash video and Real Systems; however, since there are few hardware players available that you can plug directly into your TV or speakers, they are best left in the computer room for now.

Whilst some devices, such as the Xbox and PlayStation 3 support several standards, most dedicated hardware devices are limited to only supporting the standard they were designed for. This means that if you have a DLNA-certified camcorder, it is not able to stream content to a UPnP or Apple device. If you want all of your devices to communicate with each other, at this stage you need to pick a streaming media standard and ensure that any device you buy in the future is certified to work with that standard.

The Apple iTunes system is one of the easiest systems to set up and use and is really great if you have Apple Mac computers or iPods and obtain your music and video from iTunes. In order to use the iTunes system you need:

- A Mac or PC running iTunes software.
- An Apple Airport Express (to stream music from iTunes to your speakers).
- An Apple TV (to stream video and music from iTunes to your TV and sound system).

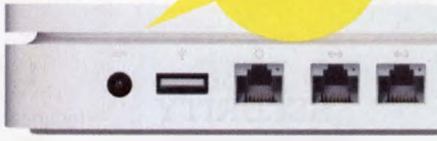
Since all of the products come from Apple and are designed specifically to work with iTunes, you can be sure that everything will work perfectly together.

All of these devices use the 802.11n (draft) protocol and whilst they should work with other 802.11n devices, this is not always the case. This is because 802.11n is

The Apple TV can stream video and music from iTunes to your TV and sound system.

Missed a tutorial?
Visit www.magshop.com.au for back issues of APC

iTunes lies at the heart of Apple's proprietary streaming solution.



The Apple Airport Express can stream music from iTunes to your speakers.

still not a ratified standard, which means that manufacturers (including Apple) are basing their devices on incomplete standards.

If the manufacturers use slightly different implementation or have designed their equipment using earlier draft standards, there is a real chance that they may not be fully compatible and will not work at the maximum available speed. In the worst case the devices may drop back to the significantly slower 802.11g standard.

Despite the improved performance of the draft 802.11n standard, the same basic rules of wireless networking still apply. You should place your hub as close as possible to the Apple TV and Airport Extreme, avoid having thick concrete walls in the signal path and try to minimise any sources of interference (such as microwave ovens, Bluetooth devices or cordless phones) directly in the signal path or next to the devices.

Since the antenna is built into the Apple devices, it is not possible to improve reception by using an external antenna, although if it is necessary to boost the signal (because there is a wall or metal ceiling in the way) you can use another Airport Extreme as a range extender.

SETTING UP

The first step is to find the best location for the Apple Airport Extreme wireless hub. Since we will be mainly using the Apple TV in the bedroom and home theatre room and the Airport Express in the kitchen or out the back on the verandah, we relocated our internet router and Airport Extreme wireless hub downstairs in the games room. To reconnect the computer in the office, we simply used the network cable that runs from upstairs to downstairs and installed a small network switch upstairs for the office computers.

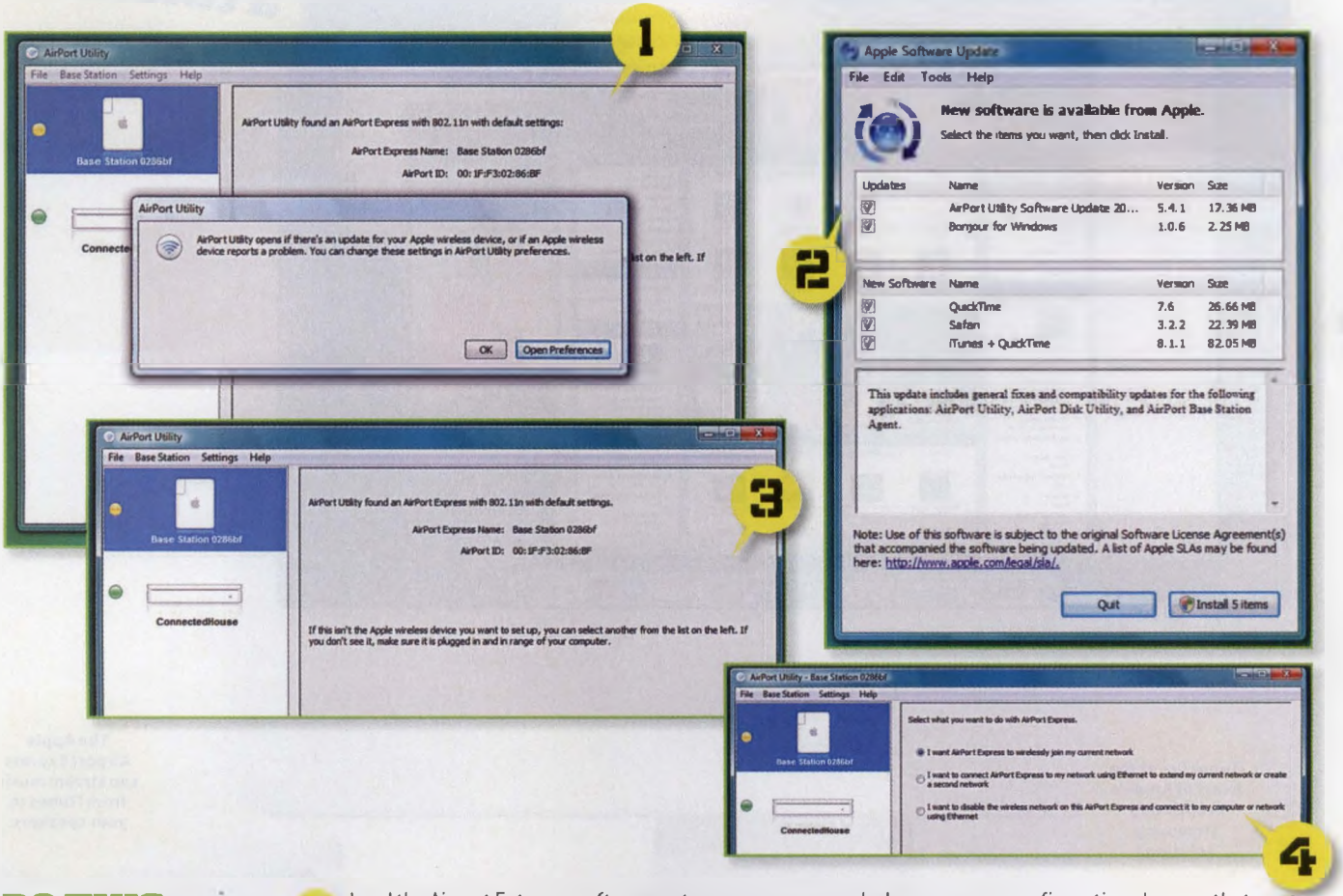
Since we wanted to use iTunes as a server to stream both audio and video to our other Apple devices, we installed it on our dedicated home theatre computer.

iTunes loads a lot of other software (such as Bonjour, iPod drivers and synching services) onto your computer and we found that having iTunes installed does impact on the performance of the machine, particularly if the computer has limited RAM. For this reason we would recommend against loading iTunes on a netbook or really old computer.

The next step is to connect the Airport Extreme wireless hub to your network. The Airport Extreme does not include an ADSL or 3G wireless router so you will need to connect it to your ADSL or 3G modem. If your ADSL modem has a built-in router (like the Internode-supplied Billion modem router we have in the Connected House), connect the Airport Extreme directly to one of the ports on the modem router.

USE THIS... APPLE AIRPORT EXTREME

If you are setting up an Apple system, I would also recommend you purchase an Apple Airport Extreme wireless hub, as this will give you the best streaming media performance with the Apple Airport Express and Apple TV.


1
AirPort Utility
File Base Station Settings Help
Base Station 0286bf
AirPort Utility found an AirPort Express with 802.11n with default settings:
AirPort Express Name: Base Station 0286bf
AirPort ID: 00:1F:F3:02:86:BF
AirPort Utility
AirPort Utility opens if there's an update for your Apple wireless device, or if an Apple wireless device reports a problem. You can change these settings in AirPort Utility preferences.
OK
Open Preferences
2
Apple Software Update
File Edit Tools Help
New software is available from Apple.
Select the items you want, then click Install.
Updates Name Version Size
AirPort Utility Software Update 20... 5.4.1 17.36 MB
Bonjour for Windows 1.0.6 2.25 MB
New Software Name Version Size
QuickTime 7.6 26.66 MB
Safari 3.2.2 22.39 MB
iTunes + QuickTime 8.1.1 82.05 MB
This update includes general fixes and compatibility updates for the following applications: AirPort Utility, AirPort Disk Utility, and AirPort Base Station Agent.
Note: Use of this software is subject to the original Software License Agreement(s) that accompanied the software being updated. A list of Apple SLAs may be found here: http://www.apple.com/legal/sla/.
Quit
Install 5 items
3
AirPort Utility
File Base Station Settings Help
Base Station 0286bf
ConnectedHouse
AirPort Utility found an AirPort Express with 802.11n with default settings.
AirPort Express Name: Base Station 0286bf
AirPort ID: 00:1F:F3:02:86:BF
If this isn't the Apple wireless device you want to set up, you can select another from the list on the left. If you don't see it, make sure it is plugged in and in range of your computer.
4
AirPort Utility - Base Station 0286bf
File Base Station Settings Help
Base Station 0286bf
ConnectedHouse
Select what you want to do with AirPort Express.
I want AirPort Express to wirelessly join my current network
I want to connect AirPort Express to my network using Ethernet to extend my current network or create a second network
I want to disable the wireless network on this AirPort Express and connect it to my computer or network using Ethernet

DO THIS... SECURITY

For additional security, we recommend protecting access to shared disks (such as Apple Time Machine devices) with a separate disk password and disabling guest access (again to keep the neighbours out).

1 Load the Airport Extreme software onto your home theatre machine and let it check for updates.

2 As well as updating the Airport Utility, it will also check for and download updates for iTunes, Safari and Quicktime. If you are using a Mac, all of the Airport and iTunes software is already loaded onto the machine, although updates are likely to be required.

It is possible to configure an Airport Extreme wirelessly, but we would recommend using a wired connection, as it will be faster and easier to make the changes to the network.

3 After you load the Airport Utility, you should see the Airport Extreme device on the right-hand side of the panel. If you do not, check to ensure that the hub is plugged in to the network and the modem/router is connected to the internet port of the hub. Once the device is detected, there should be an orange status indicator letting you know that the device needs to be configured.

4 You can choose to perform a manual setup, but, for most networks, using the step-by-step wizard will be adequate. One of the first things that will happen is that the Airport Utility will check and, if necessary, update the firmware to the latest version. After this is done, the hub will restart and you will be able to resume configuring it.

You will be prompted to enter the password, which is the default listed in the manual. If you purchased your equipment second hand or have forgotten the password, it is possible to reset the device to the factory defaults by pressing a small switch on the back of the device for 10 seconds; however, any configuration changes that were made will be lost.

The Airport Utility will then give you the option to make changes to the configuration or reset it to the factory defaults. Since it is easy to find the default password, it is highly recommended to make the changes to keep your neighbours out of your network!

You will be given an option to set the Airport Extreme Name, which is the name of the device that will appear on the Airport Utility. You will also be prompted to enter a password for the hub. For security this password should be a unique combination of letters and numbers that cannot easily be guessed. Avoid obvious combinations such as dictionary words or birthdays, which can be guessed by brute force attacks from the internet (if you don't have a firewall).

The next step is to either join an existing wireless network or create a new network. If you already have a wireless network and connect your computers wirelessly, then join the existing network. However, if you connect your computers using cables (as we do in the Connected House), we would recommend creating a separate network just for streaming content around your house and leaving the other wireless network just for your computers.

You will then be prompted to enter a Wireless Network Name, which is the SSID of your wireless network and the name of the network that your other Apple devices (and computers) will connect to. This can be something easy to remember.

You will also be prompted to choose the wireless

security method you will use. For best security, use WPA2 Personal and select a random combination of numbers, letters and punctuation symbols. Write this password down somewhere as you will need it when you want to connect other devices (such as the Apple TV, Airport Express and iPods) to the network.

You will then be given a summary page and the option to display the passwords. Since anyone who knows the device password can access this page, it is important to keep all passwords to the hub and wireless network secure! Choose update and, after a restart, the Airport Extreme will be ready.

The next step is to configure the Airport Express to allow you to stream music to it. The procedure is fairly much the same as configuring an Airport Extreme hub, with the main difference being that you will configure this device wirelessly.

To do so connect to the Airport Extreme from the Network and Sharing Centre in Vista (or from the network configuration page on the Mac). The Airport Extreme will have a default name and password as described in the manual. Once you have successfully connected to the Airport Extreme, you would configure it the same way as describe previously except that will join an existing network by entering the Wireless Network Name and password for the Apple wireless network.

Once this is done, the Airport Extreme will restart. You will need to reconnect to the Airport Extreme from the Network and Sharing Centre using the name and password for your Apple wireless network.

Now comes the easy part! Once you have connected to the Airport Extreme, iTunes will automatically detect the device and give you the option to stream music to either your computer's speakers or the Airport Extreme or both! To listen to music on the Airport Extreme, simply plug in a set of power speakers, such as the Altec Lansing Expressionist Bass speakers we have in the Connected house, and enjoy. You can stream music from playlists directly to the Airport Extreme as well as internet radio, podcasts or anything else you can listen to on iTunes. If you have an iPhone or iPod Touch you can download the Remote app from the App Store (it's free) and connect your iPhone or iPod Touch to the network. This will allow you to remotely control the playlists or tracks streamed to the Airport Extreme. How cool is that?

Once you have the Apple network set up, connecting an Apple TV is very easy. The only problem with an Apple TV is that it only has HDMI or component video outputs so it will not work with an older TV that uses composite (yellow jack) or S-Video connections.

Connecting up an Apple TV is a simple matter of plugging the unit into your high-definition television (we would recommend using the HDMI connector) and turning it on. You will be prompted to select the wireless network and enter the password using the supplied remote control to access the on screen display.

Once connected to the network, the Apple TV will download any firmware updates automatically and restart. You could use the Apple TV as a standalone device to purchase movies and TV shows from the iTunes store, but if you connect it to iTunes on your PC or Mac you can stream music and video directly to the Apple TV from your computer.

To connect your Apple TV, simply write down the five digit passcode that appears on the screen and enter the same numbers into iTunes when you select the Apple TV. It is that simple! iTunes will then give you the option to synchronise your media files to the Apple TV allowing you to watch downloaded movies either on your PC or in the lounge room. Again, if you have an iPod Touch or iPhone, you can use this device to control the programs and music that are streamed to the Apple TV.

Whilst these Apple devices are really easy to use and work well, the Apple solution is not for everyone. If you are more technically inclined and want to play content from sources other than iTunes, you might prefer to build a home theatre PC from scratch.

We'll show you how next month.

[THE iTUNES SYSTEM IS ONE OF THE EASIEST SYSTEMS TO SET UP AND USE]

IN THIS SERIES

Did you build a web site and nobody came? **Ash Nallawalla** explains why and how you can attract the right visitors. This month we will see how to exploit certain features in the so-called Web 2.0 applications.

PART 9 SEARCH ENGINE OPTIMISATION

Optimise Web 2.0 search results

Optimising your Web 2.0 blogs, forums, images and search results.

APC EXPERT

ASH NALLAWALLA

Ash manages natural and paid search traffic for some of Australia's largest web sites. He is an internationally acknowledged expert in search marketing, and he previously operated an SEO training business. Recently, he presented two sessions at the WebmasterWorld Conference in Las Vegas, which he has written up at his blog **www.netmagellan.com**. Ash can be contacted at **seo@acpmagazines.net**.

WHAT'S NEXT?

PART 10
JULY '09
DIAGNOSING A SICK RANKING

One of Google's early patents sheds some light on how a blog post will fare in a search, particularly a search on Google's Blog Search. I credit Bill Slawski of SEO By The Sea for highlighting the patent's relevance to blog ranking. That post is over a year old but his interpretations of a couple of patents will get your mind thinking about algorithms.

You can read his post at URL: **www.seobythesea.com/?p=541**, but, in essence, there are two scores involved in a blog search result:

- Relevance Score, which could (note "could") be based on: How often does the searched keyphrase occur in a post?; placement of the searched keyphrase, eg. in title tag, H1, etc.; and enhancement of the searched keyphrase, eg. bold, italics, font size, etc.
- Quality Score, which could be (implied in this patent) based on:

Positive Signals, such as: Subscriptions from news aggregators such as FeedBurner; number of searches for a keyphrase and the number of times a particular blog is selected; listing of the blog in blogrolls, particularly in reputable blogs; user-generated tags such as the ones enabled with WP-Cumulus for WordPress; forum posts, references in emails, chat sessions that contain a link to the blog; PageRank of the blog's home page and, eventually, the PR of the post.

Negative Signals, such as: Infrequent posts; mismatch between the post content and what was in the RSS feed; presence of spammy words in the post; identical length of posts; link concentration to one main target site; ads in the body of posts (ads in the sidebar are OK).

SEO FOR WORDPRESS

WordPress is a free blogging platform you can install on your site easily if your host has given you a control panel with such an option. (If you have cPanel as the control panel, then the Fantastico option leads to many packages you can install, including WordPress, Joomla and others.)

WORDPRESS PLUG-INS

WordPress can be enhanced with the help of free plug-ins, which you can download from **www.wordpress.org** or from other sites. Here are the ones I use when I have SEO in mind:

All in One SEO Pack: It enables you to generate meta tags, optimised page titles and avoids indexing of duplicate content.

Headspace2: It is a new competitor to the above plug-in.

Akismet: This spam filter comes with WordPress but you have to get a special key to enable it.

Google Sitemap Generator: You can generate the sitemap.xml file for all search engines, not just Google.

Math Comment Spam Protection: Commenters have to solve a simple arithmetic test, eg. 2+7 to prove that they are human and not a spam robot.

FeedBurner FeedSmith: Helps to publicise your blog to subscribers.

Link to Me Textbox: Makes it easy for someone to cut and paste code to link back to your post.

Robots Meta: Adds numerous robot-related controls to prevent some pages from being indexed, such as author and date-based archives (duplicate content concern), opting out of Yahoo and DMOZ directory descriptions being used in SERPs, and so on.

SEO FOR CONTENT MANAGEMENT SYSTEMS

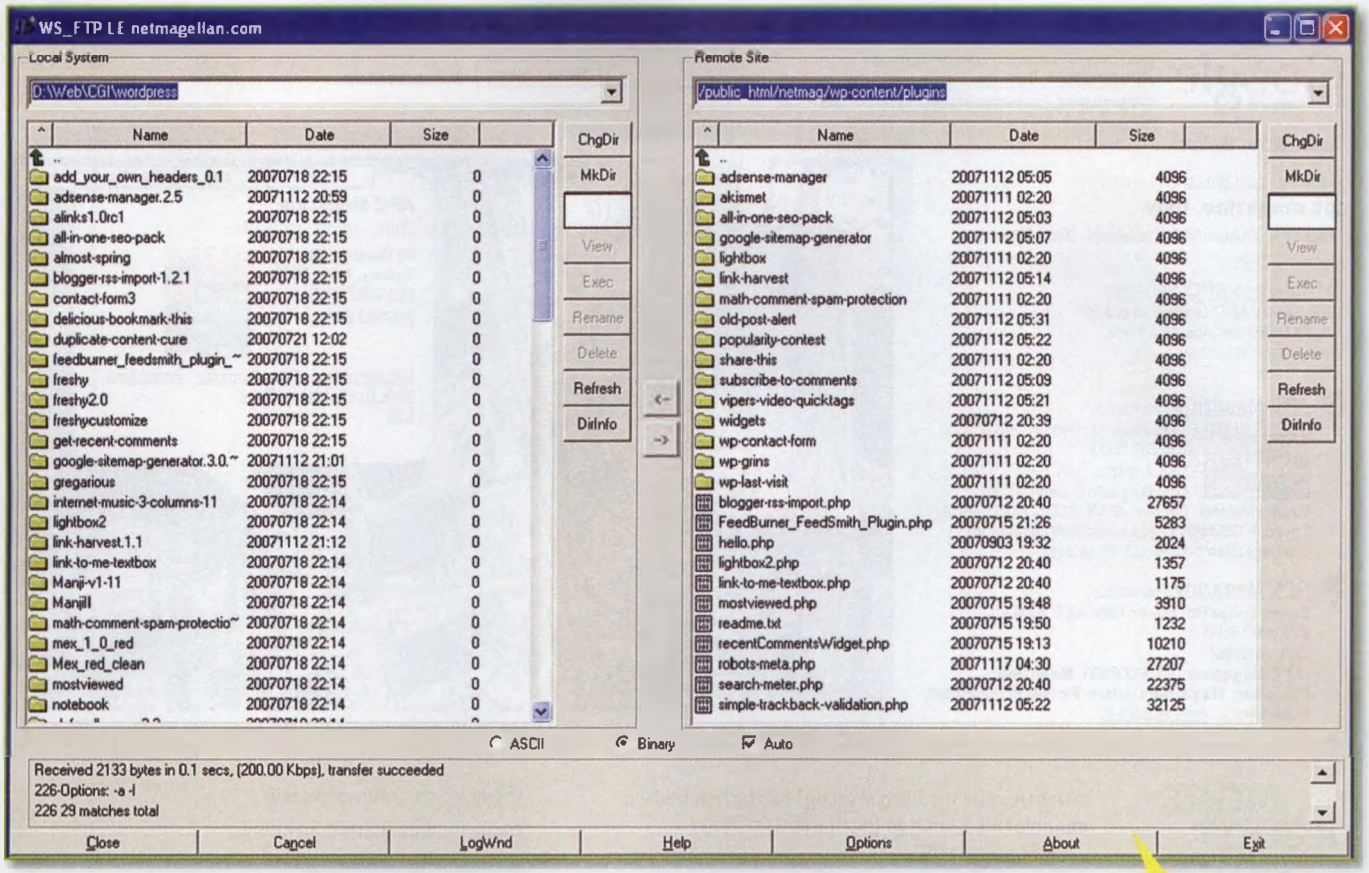
There are thousands of content management systems (CMS). Joomla is my open-source CMS of choice and it is free. You can install it on your site very easily if your host has given you a control panel with such an option.

About half my sites run the old version 1.0.x, while the rest run 1.5.x. I am using 1.0.x examples here, but most of the tips will work for 1.5.x.

BASIC SEO FOR JOOMLA

Out of the box, Joomla is not as search-engine-friendly as we would prefer. You can take certain precautions to improve this deficiency:

Joomla comes with sample data and datafeeds. Remove this data, or, better still, opt out of installing it if you are using a control panel installer such as Fantastico.



You upload WordPress plug-ins to the /wp-content/plugins directory.

Otherwise your site will contain information about Joomla and Linux, which might not match the theme of your site. I have one such site where I am still discovering sample data in hidden places.

The Site Name field in the configuration area should be short, eg. *APC Magazine*. Don't stuff it with keywords, else you may find that Joomla uses it for unexpected purposes, such as in the Subject field of emails sent from your site.

Joomla can generate PDF files from your content, accessed through a PDF icon on the page. While this may look impressive, it is duplicate content and the PDF file has no links that a spider can follow, so turn off the PDF feature. This also applies to the Printer-friendly icon.

Don't add buttons for social bookmarking sites unless you can use rel="nofollow" for those links. If your content is unlikely to be featured on the home page of those sites, don't use such buttons. You don't want to annoy such sites.

Redirect the non-www URL of your site to **www.example.com** using an entry in .htaccess (covered in Part 7, APC March 2009).

Enable the cache, as it will speed up the page serving to the spiders and humans alike.

Use search-engine-friendly titles for Sections and Categories, for they appear in URLs.

Check the Google Sitemap file before submitting it, as it might contain pages that are not useful to a visitor. (Joomla can generate duplicate URLs that end up in the sitemap.)

Check the default Joomla meta data and empty it or replace it with something relevant to your site. Note that updating Joomla replaces your customised meta data, so keep a copy and re-enter it after the update.

WHICH SEF COMPONENT?

You should create search-engine friendly URLs to replace the long ones generated by Joomla. I use a discontinued version called OpenSEF on my Joomla 1.0.x sites and SmartSEF for version 1.5.x. Others prefer one called SH404SEF — the choice is vast.

Example: Internal URL: **index.php?option=com_content&task=view&id=13&Itemid=30**.

Friendly URL: **/courses.html**.

OpenSEF can mislead you if you follow its default settings, as it will create the Google sitemap in its own component directory. Google will not accept this, as the sitemap needs to be at the root level.

So, create an empty text file (0 bytes) called **sitemap.xml** and upload it to the root directory. Make it writeable. Then, in OpenSEF, supply the sitemap XML file name as "sitemap" with no extension. The location field should be left blank.

Then go to the Google Sitemap option and choose Generate XML.

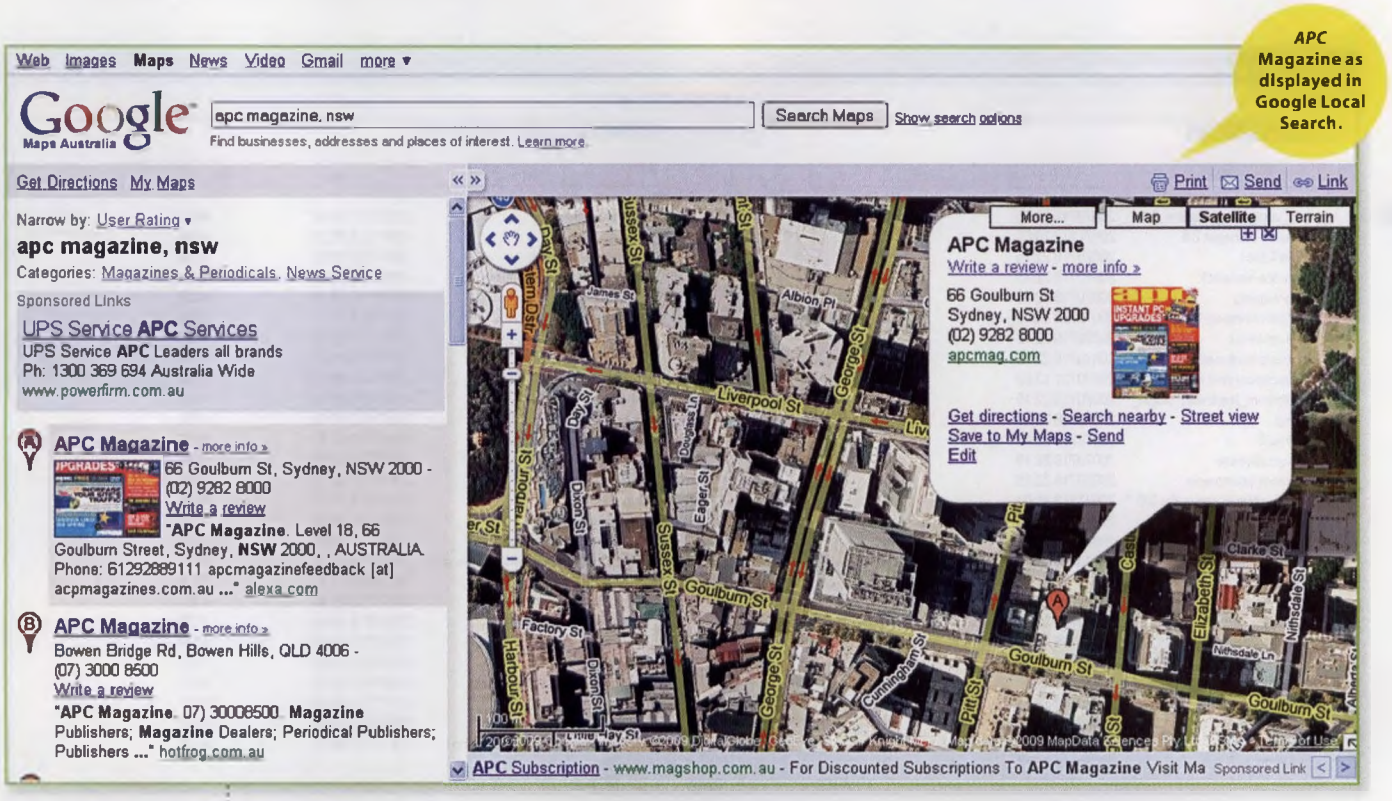
Next, save the XML file.

Next, submit it to Google Sitemaps.

Log in to Google Webmaster Tools and explicitly add this sitemap. You are now done.

SEO FOR FORUMS

Discussion forums pose a problem to spiders because their architecture is based on user convenience and not search engine ranking. For example, a discussion thread (the


Web Images Maps News Video Gmail more
Google Maps Australia
apc magazine, nsw
Search Maps
Show search options
Find businesses, addresses and places of interest. Learn more.
Get Directions My Maps
Print Send Link
Narrow by: User Rating
apc magazine, nsw
Categories: Magazines & Periodicals, News Service
Sponsored Links
UPS Service APC Services
UPS Service APC Leaders all brands
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More... Map Satellite Terrain
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Write a review - more info »
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(02) 9282 8000
apcmag.com
Get directions - Search nearby - Street view
Save to My Maps - Send
Edit
Goulburn St
Liverpool St
George St
Sussex St
Clarke St
Elizabeth St
Factory St
Harbour St
Cumberland St
Pitt St
Albion Pl
James St
Day St
Dixon St
Eager St
Nithsdale St
APC Subscription - www.magshop.com.au - For Discounted Subscriptions To APC Magazine Visit Ma
Sponsored Link

APC Magazine as displayed in Google Local Search.

MORE ABOUT... SEO FOR MOBILE SEARCH

To optimise pages for mobile search, consider the following tips:

- Ensure strict compliance with W3C XHTML standards.
- Follow accessibility (508) guidelines.
- Build lean pages with the use of linked CSS files to keep formatting off the page. Provide a separate style sheet for mobile users.
- Some people recommend using "display:none" in CSS as a way to show some content to desktop users and not to mobile users.

lowest level in the file hierarchy) can be reached via multiple URLs, such as (partial list):

- The direct URL
- A list of new threads on the home page
- Printer-friendly version
- Member list and their recent posts

This can create a duplicate situation as well as sending the spiders in a loop that they cannot escape (other than their own time limit). Since you want the spiders to crawl important content just once, you can adjust the robots.txt file accordingly. The following is from a forum that uses vBulletin, considered one of the best scripts for this purpose:

```
User-agent: *
Disallow: /test.html
Disallow: /forums/login.php
Disallow: /forums/printthread.php
Disallow: /forums/member.php
Disallow: /forums/memberlist.php
Disallow: /forums/calendar.php
Disallow: /forums/sendmessage.php
Disallow: /forums/subscription.php
Disallow: /forums/showpost.php
Disallow: /forums/showgroups.php
Disallow: /forums/search.php
Disallow: /forums/report.php
Disallow: /forums/image.php
Disallow: /forums/misc.php
Disallow: /forums/register.php
Disallow: /forum/attachment.php
Disallow: /forum/avatar.php
Disallow: /forums/newthread.php
Disallow: /forums/usercp.php
Disallow: /forums/newreply.php
Disallow: /forums/private.php
Disallow: /forums/index.php?referrerid
Disallow: /forums/sendtofriend.php
Disallow: /forums/forumdisplay.php?page
Disallow: /forums/forumdisplay.php?sort
Disallow: /forums/forumdisplay.php?order
Disallow: /forums/forumdisplay.php?pp
Disallow: /forums/forumdisplay.php?daysprune
Disallow: /forums/forumdisplay.php?do
Disallow: /forums/showthread.php?page
Disallow: /forums/showthread.php?pp
Disallow: /forums/showthread.php?p
Disallow: /forums/showthread.php?mode
Disallow: /forums/showthread.php?goto
Disallow: /forums/showthread.php?post
Disallow: /forums/showprofile.php
```

The following is a robots.txt file from a forum site that runs phpBB software:

```
# Applies to all robots
User-agent: *
```

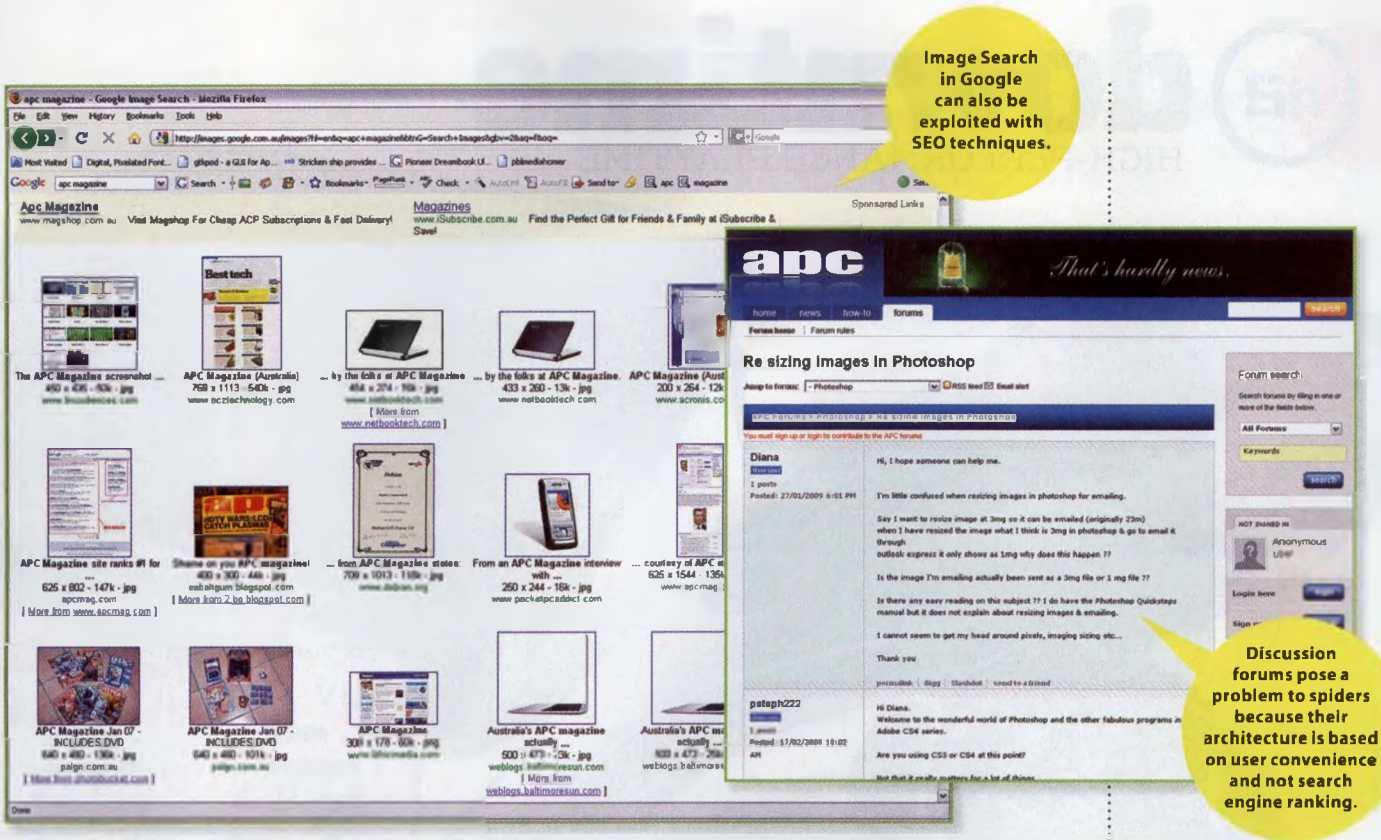


Image Search in Google can also be exploited with SEO techniques.
Discussion forums pose a problem to spiders because their architecture is based on user convenience and not search engine ranking.
apc
That's hardly news.
Re sizing images in Photoshop

```
Disallow: /forums/posting.php
Disallow: /forums/search.php
Disallow: /forums/post-
Disallow: /forums/updates-topic.php
Disallow: /forums/stop-updates-topic.php
Disallow: /forums/ptopic
Disallow: /forums/ntopic
Disallow: /sys/
Disallow: /calendar/
Disallow: /include/
Disallow: /resources/
```

SEO FOR IMAGE SEARCH

Image Search in Google can also be exploited with SEO techniques. Sometimes an image result appears above the first organic result, so it is worthwhile to optimise images for this type of search. Depending on the reason for someone searching for an image, there can be an advantage in certain industries. For example, an image search for a type of jewellery could be someone researching to buy, whereas a search for a picture of an African elephant could be a student researching a school project.

Currently, Google looks at the text around an image to get a context for it. It also uses other markers such as Alt tags, anchor text, and so on. A recent paper by Google researchers proposes a better way to analyse the images themselves and refers to "VisualRank", which is similar in concept to PageRank for pages.

The following techniques are known to help rank high in an image search:

- Larger images (300 pixels by 300 pixels or more) tend to be favoured for appearing in search results.
- Use keywords for file names, anchor text, Alt tags, and in the page containing the image, just as you would otherwise optimise the page.
- Include images in a site map, or build a site map purely for images.

SEO FOR LOCAL SEARCH

Local search is very important for small businesses. There are many services whose customer base is within a few kilometres from their outlets. The broad guideline is to ensure that the web site contains geo-location or at least postal and postcode reference that can be reached by the spiders. Additionally, there are location-specific web sites that are particularly beneficial for SEO value.

- GeoTags: **www.geotags.com/**. This site helps you to create geo meta tags such as: <meta name="geo.placename" content="Milpitas, California" />; <meta name="geo.region" content="US-CA" />. There is no current SEO benefit in using this, but some SEOs are using such tags.
- Microformats: **http://microformats.org/**. The hCard generator enables you to code your name and contact information in a geo-location-friendly format.
- GeoURL: **www.geourl.org/**. Submit your URL after you have placed an ICBM meta tag such as this: <meta name="ICBM" content="-37.53,145.05" />.
- Craigslist: **www.craigslist.org/**. Craigslist is a very popular free classifieds site that is available in many countries. A listing in a remote town lasts for 45 days. Be very careful not to spam it.
- Google Local: **http://local.google.com/**. You can register your own site and have it show up in a local search.
- Address information: Sites that display properly formatted addresses and telephone numbers can be picked up and displayed in a local search result.

DISCUSS ONLINE...

Have you registered at the *APC* Forum at *apcmag.com*? As we get into the more technical aspects of SEO, you might notice that space limitations don't allow certain topics to be covered in depth. If you have any question about this series, or about SEO in general, Ash is monitoring the SEO forum and will do his best to answer your questions. Other readers are also encouraged to help each other.

112 downtime

HIGH-PERFORMANCE PLAYTIME

01 SMART ANIMALS SCANOPEDIA

Teach kids about animals by getting them to shoot lasers at them. How futuristic! The brand-new Discovery Channel Smart Animals collection encourages kids to explore nature by scanning scale models of animals as well as a giant poster full of scannable images, interactive maps, games and other activities with the talking Scanopedia. With over 2,500 sound effects, facts, quizzes with information for over 200 animals, this is a surprisingly novel way to get your kids learning. Plus, if they don't seem too bright and have problems picking it up, they'll at least have gained scanning experience for their future job at Woolies.

- CONTACT Funtastic
- ONLINE www.funtastic.com.au
- PRICE $59.95

02 POLAR FT80 TRAINING WATCH

This is more than just a heart monitor in a wristwatch, the Polar FT80 is an intelligent training computer that keeps track of your fitness levels to measure your performance against weekly training targets. As you work out, the FT80 will adapt your training habits to keep you exercising efficiently and set new targets. Basically, it's a personal trainer on your wrist, keeping track of things like your heart-rate, calories burned and conducting regular fitness tests to chart your progress. Plus it's water-resistant and you can take it online for more detailed info and assesments. Now we just have to get to the gym.

- CONTACT Fit Shop
- ONLINE www.fitshop.com.au
- PRICE $539

03 SONY DVD DIRECT EXPRESS DVR-P1

HD camcorders are great gadgets that let you record high-def images of the highlights of your life. The biggest hassle is getting these images off the camera to share them with your frineds. You don't want to have to spend eternity sitting in front of a PC monitor using your camcorder as a VCR. The DVR-P1 DVD Writer is designed strictly for late-model handycams and is a simple way of getting your films onto DVD. Just insert a blank DVD, plug in one cord and start playing your videos on your camcorder. The DVR-P1 will burn your video in real-time straight to disc in high-quality images. Problem solved, if you have a Sony.

- CONTACT Sony Australia
- ONLINE www.sony.com.au
- PRICE $199

04 ILUV TWO-TONE SILICON CASES

Most sleeves on the market do a good job of keeping the body of your iPhone scratch-free while doing nothing to protect your screen. The iLuv Two-Tone Silicon Cases not only protect the ultra-shiny metal body of your iPhone, they also come with a glare-free protective film that protects your screen, without interfering with the iPhone's touchscreen functionality. These soft silicon sleeves are a perfect fit for the iPhone that come in two colours (pink and blue), as well as plain silicon or a misty grey for a natural look. We recommend you make a small investment in a silicon sleeve to protect the larger investment you made in your iPhone 3G.

- CONTACT iWorld
- ONLINE www.iworldaustralia.com.au
- PRICE $17.95

ILUV BEAN IN-EAR HEADPHONES

05

We're big fans of in-ear headphones here at *APC*. They're a lot more comfortable to wear and they're better for your ears, as they require less volume to be heard clearly. This is just the case with the iLuv BEAN noise-isolation earphones. With different size ear-pieces included, these high-performance speakers fit snuggly into your ear canal, effectively blocking most of the external noise that interferes with your music. They have a good, crisp sound with a high-frequency range, minimal distortions and can handle high volume levels (though you won't need it). In-line volume controls and a wire reel make this a high-quality bargain for the price.

- CONTACT iWorld
- ONLINE www.iworldaustralia.com.au
- PRICE $19.95

PEANUT MEMORY STICK HOLDER

06

It wasn't that long ago that DVD burners were the standard way of physically swapping data; it looks as though those days are past. Everybody seems to be carrying around a memory stick of some form these days. The Peanut Memory Stick Holder is a nifty Neoprene (the material of the 21st Century, apparently) sleeve that is designed with a stainless steel ring that will attach the Peanut to almost anything. Hook it on your bag or on your belt and the Peanut will keep your digital life safe and easily locatable. Gone are the days of searching amongst the junk at the bottom of your bag for something half the size of your little finger.

- CONTACT Built
- ONLINE www.until.com.au
- PRICE $14.95

I-GOTU GT120 USB GPS TRACKER

07

This is not a stalking device... although it could be. This is basically a GPS tracking device that you can use to follow the movements of whoever has it on their person. The i-gotU allows you to review detailed information (after the trip) about a vehicle or person or travel activities using GPS and digitised street mapping on Google Map & Google Earth. The i-gotU evaluates travel activities, with proof of exact date, time and location of the places the person your tracking goes to. Or, for the non-paranoid, you can use it to geo-tag your digital photos or videos for later reference. FYI, *APC* doesn't condone stalking.

- CONTACT Expansys
- ONLINE www.expansys.com.au
- PRICE $158

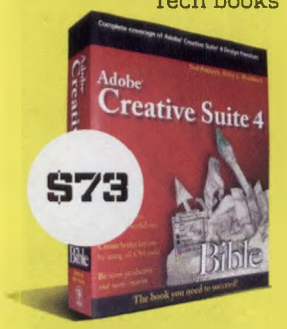
BLUEANT V1 VOICE CONTROL

08

BlueAnt's V1 Voice Controlled Bluetooth 2.1 Headset introduces the BlueGenie voice user interface that lets you control most functions with the sound of your voice. Plus, if you're having problems, the headset will actually talk back to you! Pushing one button activates the voice recognition technology and gives you control of all the functions of the V1, just by talking. If you need assistance, ask for it and the headset will verbally help you get the commands you want. The headset quality is very good, with noise suppression and echo cancellation ensuring that most background noise is removed. Plus, it looks extremely sexy.

- CONTACT BlueAnt
- ONLINE www.blueant.com.au
- PRICE $129.95

Inprint
Tech books

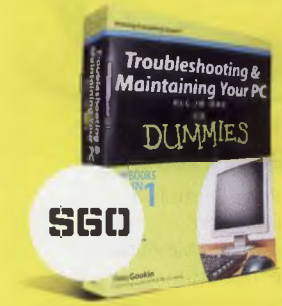


$73

ADOBE CREATIVE SUITE 4 BIBLE

www.johnwiley.com.au

At 1,200 pages this is almost as thick as the Bible. This is one of the few books to cover integration and workflow issues between *all* the major CS4 products. With hints, guides and tutorials on most areas of web and print design, this is a must-have for any professional who wants to get the most out of CS4.



$60

TROUBLE-SHOOTING AND MAINTAINING YOUR PC

www.johnwiley.com.au

This is the one-stop guide on how to handle common PC problems and is written with clear instructions. *Troubleshooting & Maintaining Your PC All-in-One For Dummies* is divided into six mini books covering hardware, software, laptops, internet, networking and maintenance. Each one gives you some background on what causes common problems, to help you understand what's wrong as well as how to fix it.

DOWNTIME REVIEW

Dexim AV iPhone Dock Station

Why bother with an iPod dock when you can get your iPhone thumping through your home stereo?

The use of iPods as more than personal music players has become more popular in recent months, with accessory manufacturers flooding the market with iPod docks of all shapes and sizes (as you would have seen in our last issue). iPod docks are fine and dandy if you need something for the kitchen or bedroom, but do you really want to have to buy a new speaker dock when you have a kick-arse sound system sitting in your lounge-room? I'd say not.

The AV Dock Station from Dexim amplifies your iPhone/ iPod experience by allowing you to plug your iWhatever directly into your stereo's amplifier as if it were just another conventional component (which it is).

The device allows you to listen to music through your home stereo or show off photos and videos the way you really want to, on your TV screen. Now your iPhone becomes a digital entertainment hub that is accessible through your more traditional video and audio equipment. As you would expect, the Dexim AV Dock Station also conveniently charges your iPod or iPhone when connected.

Installation is just as simple as connecting any other kind of stereo component. Just plug and play. The base unit is small enough to go unnoticed on your entertainment unit when the Dock Station is not in use, so it is as unobtrusive as it is functional.

So chuck your dinky (but nice) little iPod speaker dock into the bedroom, relax on the coach, pull out the remote and get ready to blast your MP3 collection through your existing home system. After all, that's really what you bought it for wasn't it?

Christopher Zammit

$99

9
10

50 WORDS

. . .on why you need some iLuv.

To kick things off, we have an iWorld accessories pack for the best entry who can tell us in 50 words (or less) why they need some iLuv. The prize pack consists of an iLuv International Charger pack, a Dexim AV docking station and a set of his and hers matching iPhone two-tone silicon cases and iLuv in-ear noise-isolation earphones.

Entries close June 16th. Winners will be contacted by email.

Email your entry to:
downtime@acpmagazines.com.au

THE NETBOOK

Consumers want smaller, more portable computing with the functionality of a full-sized PC, if the ever-increasing sales of netbooks are anything to go by. Their reduced size has made them a true replacement for the much-loved typewriter.

What's hot & not

TECHNOLOGY THERMOMETER

THE TYPEWRITER

They dominated the Twentieth Century as the most common office device (after the pen) and are still used by many today. Their get-it-right first-time uneditability and lack of portability was the key to their demise.

BLU-RAY PICKS OF THE MONTH

.: CONTACT Twentieth Century Fox
.: ONLINE www.foxmovies.com.au
.: PRICE $34.95

QUANTUM OF SOLACE

Daniel Craig returns in the second-best Bond film of all time, falling *just* short of the greatness of *Casino Royale*. Set one hour after its predecessor, *Quantum of Solace* sees Bond go on a killing spree as he hunts down the men responsible for the death of his short-lived girlfriend, Vespa. The plot is a little thin, as Bond moves from one amazing, jaw-dropping action set-piece to the next with only vague references to who some of the bad guys are and why they need to be killed. That minor quibble aside, Bond 22 delivers good performances, great action sequences, cool cars and hot Bond girls.

.: CONTACT Twentieth Century Fox
.: ONLINE www.foxmovies.com.au
.: PRICE $34.95

THE DAY THE EARTH STOOD STILL

A lone alien named Klaatu (Keanu Reeves) comes to Earth with a warning about an oncoming takeover by alien forces in this remake of the classic 1951 sci-fi film of the same name. This is no *Independence Day* with alien vs human battles. TDTESS is more of a moral slap on the wrist designed to deliver a timely warning of the repercussions for our violent and wasteful ways. Keanu is... well, Keanu. While Jennifer Connelly steals the show playing the role of humanity's unnofficial defence lawyer. This is a good simple story with just a minimal dousing of CGI fun to keep us nerds happy.

.: CONTACT Icon Pictures
.: ONLINE www.iconmovies.com.au
.: PRICE $36.95

SLUMDOG MILLIONARE

The winner of eight Oscars including Best Picture, *Slumdog Millionaire* is a dark journey into the lives of three orphaned children as they struggle to survive on the streets of India. The film opens with Jamal (Dev Patel from *Skins*) being tortured by the police as they accuse him of cheating on the Indian version of *Who Wants to be a Millionaire?* This brilliantly written film shows how Jamal's deprived childhood and the violent circumstances of his life had caused him to know the answers to the questions. A brilliant and insightful film that has to be the most emotionally draining feel-good movie of all time.

Nintendo DSi

The DS re-emerges in its third iteration; so what's new?

The original Nintendo DS (a chunky silver hexagonal-looking thing) was released in Australia in early 2005 and proceeded to become a best-seller, effectively retiring the Gameboy Advance (SP) as the portable console of choice and redefining on-the-go gaming for the decade. Less powerful than Sony's PSP, the two-display touchscreen DS nonetheless dominated the portable scene and was upgraded shortly thereafter to the DS Lite, which was smaller, sexier and lighter (and sported improved features). Now Nintendo is at it again, souping up the DS a second time with larger screens, better speakers, two camera lenses, an SD card slot (ie. media-playing capabilities) and, most excitingly, an App Store-like feature where you can download cheap/free new content (hopefully this will see retro titles available in the near future). Plus, techies have pulled the DSi apart to reveal a much more powerful internal processor, so hopefully there's more to this than just a glossy update to a four-year-old piece of hardware (for $100 more). Stay tuned.

Quikfix

New releases

FLOWER, SUN AND RAIN

With a title like this, you just know that Suda51's latest game is going to be another weirdo. And it sure is. You play as 'searcher' Sumio Mondo, who arrives on the island of Lospass. Charged with a number of bizarre tasks at the local hotel resort, you'll either love or hate this (and the interface is decidedly fiddly), but it's definitely a unique experience. Distributed by AFA Interactive, and available for $59.95.

PATAPON 2

Love it or otherwise, Sony's PSP exclusive strategy rhythm is back. The game kicks off right where the original finished and is packed with enough new items, weapons and rare patapons spread over 60 or so missions to keep you rhythmically pata-pata-pataponning during your morning drive-time (hands-free PSP!?! Now there's an idea.) Four-player ad hoc multiplayer has been added for the sequel. Available now for about $50.

F.E.A.R. 2: Project Origin

Troy Coleman is scared and just wants the nasty little girl to go away.

Project Origin is the follow-up to Monolith's horror first-person shooter released in 2005. Not to be confused with Vivendi's three F.E.A.R branded titles that follow a separate game timeline, and apparently don't count. Set just prior to the end of the first F.E.A.R, players take the role of Sergeant Michael Beckett on a mission to take Genevieve Aristride (controller of one part of the Armacham Technology Corporation) into protective custody. Explosions, a loopy supernatural girl and loose plot threads follow in the ensuing hours. If it's a first-person shooter you're after, then Project Origin will probably suit. The only real problems aren't isolated to PO but span the FPS genre as a whole. Armour, an arsenal of weapons and all the health packs anyone could ever need are stacked in convenient locations all over the maps; we're beyond crate-smashing, but surely there's a better way to implement this? I digress... Aside from this, PO is well paced, the enemy AI is excellent and the combat is strong, especially the slow motion blood-splatter-fest. Combine that with overall cracking sound effects (some of the environmental sounds literally gave me goose-bumps) and it's a recipe for hours of fun.

AVAILABLE PLATFORMS: PC-DVD, PS 3, XBOX 360

CONTACT Warner Bros. Interactive
ONLINE www.whatisfear.com
PRICE $89.95

✔ Strong FPS action; well paced; cracking sound.

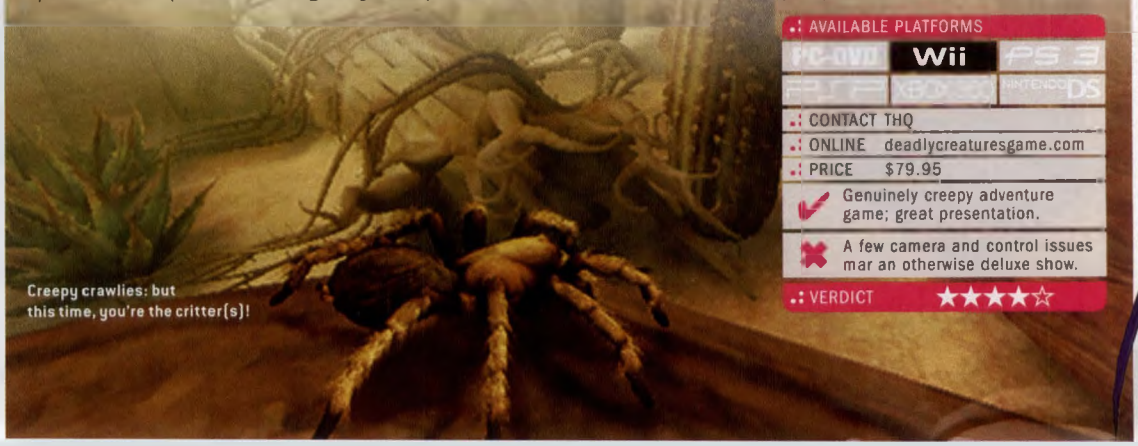
✖ Cheap round-the-corner scares a plenty.

VERDICT ★★★★☆

Deadly Creatures

Peter Dockrill regrets not getting the pest guy in.

Arachnophobes should probably just turn the page right now: believe us, this isn't the game for you. If, on the other hand, you don't have a problem with the ickier side of the natural world, then Deadly Creatures is a refreshingly simple but original adventure/action title. In a masterstroke of protagonist-reversal, the game does a full 180 on the usual old character setup by casting *you* as the spider (and scorpion). Spiders and scorpions feature regularly in games (when you think about it), but they're usually things that you have to jump over, shoot or squash. Here, you're made to directly empathise with the critter world-view, and it makes for a genuinely original and unsettling adventure experience. Crawling up walls with your furry eight legs is decidedly creepy fun, as is taking on all manner of creatures great and small (and all from a height of approximately 3cm). Featuring top-notch voice talent in the form of Billy Bob Thornton and Dennis Hopper (cast as two villainous gold-diggers in the overarching cinematic super-plot), DC pulls no punches in delivering a conventional adventure game from a never-before-seen perspective. Recommended.



Creepy crawlies: but this time, you're the critter(s)!

AVAILABLE PLATFORMS: Wii

CONTACT THQ
ONLINE deadlycreaturesgame.com
PRICE $79.95

✔ Genuinely creepy adventure game; great presentation.

✖ A few camera and control issues mar an otherwise deluxe show.

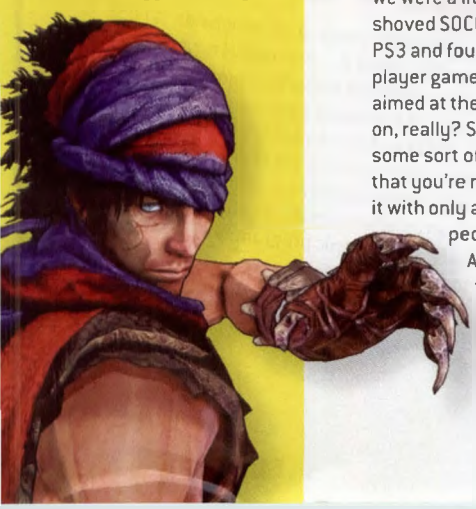
VERDICT ★★★★☆

Toprate

You've gotta try...

PRINCE OF PERSIA

The classic action adventure game has leapt from computer to console and back again since the sands of time began to fall in that pear-shaped-glass-thingy. OK, maybe not that long, but 1989 does seem like an age ago. Ubisoft picked up the series in 2004 and has guided it safely (and with mixed success) to its new abode: 'classic' title and free-roaming gaming on the next-gen consoles, PC and even the Mac. Players take the role of the inhumanly agile Prince and, together with a new sidekick, the magical and life-saving Elika, head off to roam a sandbox-ish super-stylised environment to cleanse the land of the dark god Ahriman's plague and heal the fertile regions. Once you've got a handle on the controls, linking acrobatics to negotiate the landscape looks fluidic, is a hell of a lot of fun and is easily the best element of the game. Throw in several tandem moves that can be performed with Elika's help/powers and before long you find yourself mumbling something about 'synergy'. A decent addition to the franchise but I'd suggest renting it.



GTA: Chinatown Wars

Troy Coleman wonders how convenient a sawn-off stylus would be.

Rockstar has gorged itself on the teats of the Grand Theft Auto cashcow since '97, and with Chinatown Wars (CW) its first, and exclusive, foray on the brain-fit-wholesomeness that is the Nintendo DS, they're not even close to full.

Set in Liberty City — yes the same one from GTA IV but taken in from a bird's-eye view and with a cute 8-bit look, players assume the role of Huang Lee, who's on the hunt to recover a missing family heirloom that was brutally stolen. In true GTA style, everything that follows is marinated in the heady broth of deception and corruption sided with a hail of gunfire. Aside from the main story arc, which only accounts for a small percentage of game completion, there's a huge glut of side missions and a hell of a lot of drug dealing 'side projects' that can be undertaken for fun and profit. A must for fans of the series (and any NDS-aholics).

AVAILABLE PLATFORMS: PC-DVD, Wii, PS3, XBOX 360, NINTENDO DS

CONTACT Rockstar

ONLINE www.rockstargames.com/chinatownwars/

PRICE $69.95

✔ Addictive; great DS functionality.

✖ Some very mature content for the rating.

VERDICT ★★★★★

SOCOM: Confrontation

Christopher Zammit was SOCOM-FUSED at the start.

As eager as we were to get our hands on the latest online frag-fest from Sony, we were a little taken aback when we shoved SOCOM: Confrontation into the PS3 and found that it had no single-player game. We get the idea that this is aimed at the online gamers, but, come on, really? Shouldn't there at least be some sort of basic 'training' level so that you're not chucked into the thick of it with only a vague idea of the game's peculiarities on your first go? Apparently not. Apart from that one complaint, SOCOM: Confrontation delivers with the online support Sony promised for online Tournaments, Clan Ladders and the ego-boosting Leader Boards that fans have always wanted. Gameplay is as good as any other shooter in recent times with familiar controls and good physics. The five new North African-themed maps are well realised and executed but could have been made a little more different from each other as far as visuals go. If you like your games big, then the 32-player Crossroads option should satisfy. At only $49.95, this is good value for the fans of online shooters, and with additional themed packs soon to be available for download via the Playstation Store, SOCOM: Confrontation promises enough content to keep you busy for a while.

AVAILABLE PLATFORMS: PC-DVD, Wii, PS3, XBOX 360, NINTENDO DS

CONTACT Sony Computer Entertainment

ONLINE www.socom.com

PRICE $49.95

✔ Good controls; great online content; addictive.

✖ No single-player game; trial by fire.

VERDICT ★★★½☆

chipchat

BY PETER DOCKRILL

Sour Power!

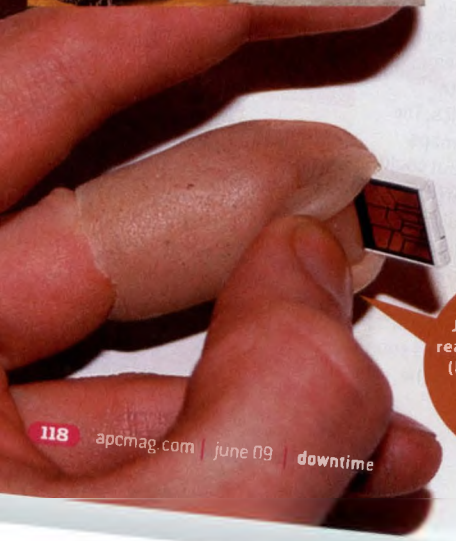
APC: it's something of a tech bible, no? Meaning, when you open these pages every month, you (reasonably) expect to find the latest and greatest practical info from the world of tech, gadgets and computing, yeah? Well, here at Chip Chat, we take this responsibility seriously. Very seriously. Which is why we're proud to present, direct from Russia to you: the best way to power up your iPod when you've misplaced your charger but happen to have a leftover crate of fresh lemons lying around. That's right, folks. No need to head over to the Apple Store for an extortionate lesson in the cost of official replacement parts. Heck, this way you can even break out a stand, a bucket of water and a little sugar to make a bit of extra pocket money on the side. Check out the process at **http://englishrussia.com**.

The Devil is in the digital

Now, *this* is what we're talking about. See, just cos us geeky guys are into the digital stuff, it doesn't mean we don't appreciate all that... *other* stuff too, you know? And that's why these digi-girls are our match made in pixellated heaven. The work of art photographer Jean-Yves Lemoigne, the aptly titled *PIXXXEL* was a spread (*ahem*) in the third issue of French magazine, *Amusement*. More at **www.jeanyveslemoigne.com/**. Oh, and if you want to find some pics of un-pixellated girls, just check out the *rest* of the internet.

But is it art? (*Actually, we don't care!*)

Every cloud...



Never let it be said that techies aren't resourceful (nor able to see the positive in a negative situation). A Finnish software developer, Jerry Jelava, has fitted himself out with a prosthetic USB finger after losing his original digit in a motorcyling accident (when he collided with a deer). As Jerry explains on his blog, the finger is not a permanent fixture, but rather a removable prosthetic "which has [a] USB memory stick inside it... Currently I have Billix, CouchDBX and Ajatus installed inside it." Looking ahead, Jerry's intends to upgrade in the future with an RFID tag. Nice. And in news just to hand, we've just heard that the deer from the motorcycle accident has now replaced one of its hooves with a taser in an attempt to one-up (and exact revenge upon) the newly bionic programmer. Best keep on your toes, Jerry... apc

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Expansion Slots	7
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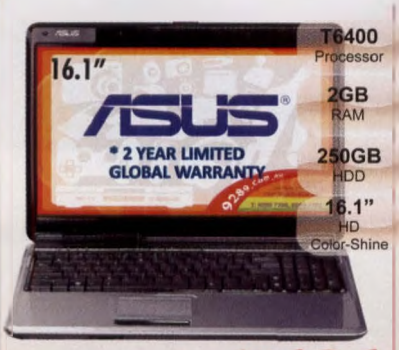

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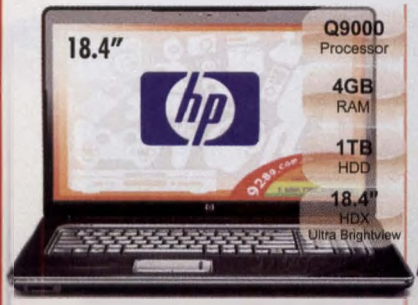

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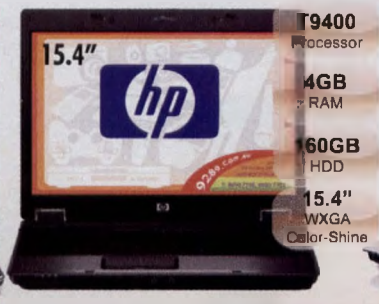

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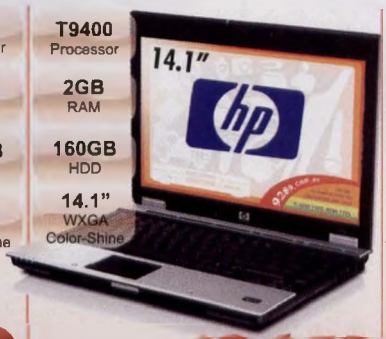

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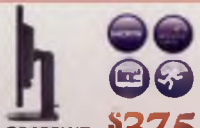

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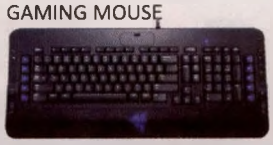

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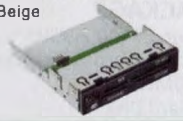

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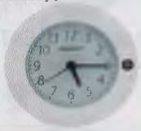

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AL-C900/1900BK	$102.00	$ 65.00
AL-C900/1900C/M/Y	$220.00	$ 65.00
AL-CX11N/C1100BK	$107.00	$ 49.00
AL-CX11N/C1100C/M/Y	$164.90	$ 49.00
AL-C1000/2000BK	$124.00	$105.00
AL-C1000/2000C/M/Y	$249.00	$115.00

Panasonic Thermal Film

Model	Genuine	TONNY
KX-FA54E	$49.00	$18 Twin Pack
KX-FA55A	$49.00	$19 Twin Pack
KX-FA134	$82.00	$35 Twin Pack
KX-FA136	$63.00	$26 Twin Pack

Lexmark Toner Cartridges

Model	Genuine	TONNY	Model	Genuine	TONNY
Optra E/E+	$ 142.00	$ 59.00	E230/232/330/332	$ 122.00	$ 55.00
E120 prebate	$ 110.00	$ 55.00	E310/312 (3k)	$ 176.00	$ 73.00
E210	$ 152.00	$ 49.00	E320/322 (3k)	$ 155.00	$ 82.00
X215	$ 112.00	$ 49.00	E321/323 (3k)	$ 155.00	$ 85.00
E220 prebate	$ 129.00	$ 79.00	X342n (2.5k)	$ 137.00	$ 69.00

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Epson Ink Cartridges

Model	Genuine	TONNY
T028	$43.60	$ 4.40
T029	$39.10	$ 4.90
T038	$20.00	$ 5.00
T039	$28.40	$ 5.60
T0461	$22.00	$ 4.50
T0472/3/4	$14.90	$ 4.50
T0491/2/3	$21.00	$ 4.50
T0494/5/6	$21.00	$ 4.50
T0621	$22.00	$ 5.20
T0631	$16.00	$ 5.20
T0632/3/4	$15.20	$ 5.20
73N BK (T0731)	$17.00	$ 7.40
73N C/M/Y (T0732/3/4)	$17.00	$ 7.40
81N BK (T0811)	$27.00	$ 8.40
81N C/M/Y (T0812/3/4/5/6)	$27.00	$ 8.40
S020089 / T052	$35.10	$ 4.80
S020093/ T050	$29.00	$ 4.80
S020187/T050	$28.00	$ 4.80
S020189/ T051	$32.00	$ 4.80
S020191 / T052	$34.00	$ 4.80

Canon Ink Cartridges

Model	Genuine	TONNY
BX-3	$47.00	$23.10
BC-05	$59.60	$26.70
BC-20	$62.00	$22.90
PG-40	$34.00	$24.00
CL-41	$35.00	$24.50
BCI-3eBK	$22.70	$ 6.40
BCI-3eC/M/Y	$20.40	$ 5.70
BCI-6BK	$24.10	$ 5.70
BCI-6C/M/Y	$24.10	$ 5.70
BCI-6PC/PM	$24.10	$ 5.70
BCI-6G/R	$24.10	$ 5.70
CLI-8BK with chip	$22.50	$ 9.80
CLI-8C/M/Y with chip	$22.50	$ 9.80
PGI-5BK with chip	$22.50	$ 9.80
CLI-8BK no chip	-	$ 5.70
CLI-8C/M/Y no chip	-	$ 5.70
CLI-8PC/PM no chip	-	$ 5.70
PGI-5BK no chip	-	$ 5.70
BCI-15BK	$24.90	$ 6.10
BCI-16C	$40.70	$ 6.30
PG-510	$24.10	-
CL-511	$27.40	-
PGI520BK	$19.30	-
CLI521BK/C/M/Y	$19.30	-
BCI-24BK	$15.30	$ 5.60
BCI-24C	$31.00	$ 6.90

Kyocera Toner Cartridges

Model	Genuine	TONNY
TK-16H	$ 73.00	$ 61.00
TK-17	$103.00	$ 35.00
TK-18	$123.00	$ 38.00
TK-310	$130.00	$ 59.00
TK-510K	$ 98.00	-
TK-510C/M/Y	$172.00	-

Panasonic Toner Cartridges

Model	Genuine	TONNY
UG-3313	$242.00	$ 73.00
UG-5545	$242.00	-
KX-PDP8 Toner for KXP7100/7110	$136.00	$ 68.00

Lexmark Ink Cartridges

Model	Genuine	TONNY
18C0781A (#1)	$36.90	$24.60
10N0016 (#16)	$49.30	$18.40
15M0120 (#20)	$63.60	$24.00
10N0026 (#26)	$53.00	$23.00
18C0032 (#32)	$36.90	$21.30
18C0033 (#33)	$39.80	$23.10
18C0034 (#34)	$41.60	$25.00
18C0035 (#35)	$49.30	$27.00
12A1970 (#70)	$55.90	$21.00
18L0032 (#82)	$50.20	$26.10
18L0042(#83)	$62.60	$23.90

Brother Ink Cartridges

Model	Genuine	TONNY
LC-37BK	$25.20	$ 5.00
LC-37C/M/Y	$16.60	$ 6.50
LC-38BK	$24.50	$ 5.00
LC-38C/M/Y	$15.90	$ 6.50
LC-47BK	$34.60	$ 5.00
LC-47C/M/Y	$20.80	$ 6.50
LC-57BK	$34.50	$ 5.00
LC-57C/M/Y	$20.80	$ 6.50

HP Ink Cartridges

Model	Genuine	TONNY
C8721WA (#02BK)	$28.20	$11.00
C8771/2/3/4/5WA (#02C/M/Y/LC/LM)	$16.60	$ 8.20
C6615DA(#15)	$42.40	$14.10
C9351AA (#21)	$24.00	$16.00
C9352AA (#22)	$27.30	$21.00
C8727AA(#27)	$28.90	$14.10
C8728AA (#28)	$33.00	$22.00
51645AA (#45)	$44.70	$16.00
C6656AA (#56)	$30.60	$15.20
C6657AA (#57)	$48.90	$23.00
C6658AA (#58)	$38.80	$23.00
CB336WA(#74XL)	$44.80	$29.50
CB338WA (#75XL)	$49.80	$30.00
C6578DA (#78)	$48.80	$19.90
C9396A (#88 BK)	$49.60	$21.30
C9391/2/3A(#88C/M/Y)	$36.40	$14.70
C93662WA (#92)	$23.20	$14.70
C9361WA(#93)	$30.00	$16.90
C8765WA(#94)	$31.30	$16.90
C8766WA(#95)	$36.40	$20.00
C8767WA (#96)	$44.80	$18.10
C9363WA(#97)	$50.20	$15.80
C9364WA (#98)	$26.40	$15.80
C9369WA (#99)	$37.80	$26.20

Samsung Color Laser Toner

Model	Genuine	TONNY
CLP-300A BK	$ 86.00	$ 36.00
CLP-300A C/M/Y	$ 78.00	$ 35.00
CLT-409S BK for CLP-310/315,CLX-3170/3175	$ 70.00	-
CLT-409S C/M/Y for CLP-310/315,CLX-3170/3175	$ 61.00	-
CLP-510D7 BK	$145.00	$ 92.00
CLP-510D5 C/M/Y	$160.00	$ 92.00
CLP-600A BK	$121.00	$123.00
CLP-600A C/M/Y	$172.00	$126.00

HP Toner Cartridges

Model	Genuine	TONNY
Q2610A	$ 183.00	$ 55.00
Q6511X	$ 316.00	$ 79.00
Q2612A	$ 106.00	$ 45.00
Q2613A	$ 109.00	$ 45.00
C7115A	$ 95.00	$ 45.00
Q7516A	$ 276.00	$105.00
C4127X	$ 194.00	$ 59.00
CB435A	$ 95.00	$ 54.00
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Q1338A	$ 235.00	$ 85.00
Q5942A	$ 226.00	$ 95.00
Q5942X	$ 343.00	$105.00
Q5949A	$ 109.00	$ 49.00
Q5949X	$ 201.00	$ 55.00
Q7551X	$ 330.00	$ 76.00
Q7553A	$ 123.00	$ 55.00
Q7553X	$ 227.00	$ 59.00
C8061X	$ 194.00	$ 59.00
C4092A	$ 90.00	$ 45.00
C4096A	$ 153.00	$ 59.00

HP Color Toner

Model	Genuine	TONNY
CB540A	$109.00	$ 81.00
CB541/2/3A	$ 99.00	$ 81.00
Q6000A	$116.00	$ 78.00
Q6001/2/3A	$126.00	$ 78.00
C9730A	$339.00	$159.00
C9731/2/3A	$469.00	$159.00

Brother Toner Cartridges

Model	Genuine	TONNY
TN-2025	$ 81.20	$ 49.00
DR-2025	$ 149.20	$ 62.00
TN-2150	$ 85.00	$ 49.00
DR-2150	$ 147.00	-
TN-3060	$ 117.00	$ 49.00
TN-3185	$ 123.00	$ 49.00
TN-6600	$ 110.90	$ 49.00
TN-7600	$ 115.00	$ 49.00
TN-8000	$ 47.00	$ 19.00
TN-04BK	$ 243.00	$ 99.00
TN-04C/C/Y	$ 243.00	$ 99.00
TN-12BK	$ 129.00	$ 72.00
TN-12C/M/Y	$ 263.00	$ 105.00
TN-150/155 BK	$ 81.00	-
TN-150/155 C/M/Y	$ 97.00	-

Samsung Laser Toner

Model	Genuine	TONNY
SCX-4100D3	$110.00	$ 49.00
SCX-4216D3	$110.00	$ 49.00
SCX-D4200A	$110.00	$ 49.00
SCX-4521D3	$116.00	$ 49.00
SCX-D4725A	$110.00	$ 64.00
SCX-5312D6	$ 86.00	$ 70.00
SF-5100D3	$110.00	$ 49.00
ML-1210D3	$110.00	$ 49.00
ML-1610D2	$104.00	$ 49.00
MLT-D108S	$ 85.00	-
MLT-D109L	$137.00	-
ML-1710D3	$110.00	$ 49.00
ML-2010D3	$103.00	$ 49.00
ML-2150D8	$204.00	$ 82.00
ML-2250D5	$134.00	$ 59.00
ML-D3050B 8k	$263.00	$ 86.00

Canon Toner Cartridges

Model	Genuine	TONNY
CART 303(Q2612A)	$ 89.00	$ 45.00
CART 308(Q5949A)	$ 89.00	$ 49.00
CART 310 II(Q6511X)	$ 264.00	$ 79.00
CART 312	$ 81.00	-
EP-22 (C4092A)	$ 75.00	$ 45.00
EP-26	$ 99.00	$ 45.00
CART307BK(Q6000A)	$ 99.00	$ 78.00
CART307C/M/Y(Q6001/2/3A)	$ 105.00	$ 78.00
CART 301 BK (EP87 BK)	$ 125.00	$ 77.00
CART 301 C/M/Y (EP87CMY)	$ 140.00	$ 77.00
CART311BK	$ 155.00	-
CART311C/M/Y	$ 199.00	-
FX-3	$ 99.00	$ 45.00
FX-7	$ 139.00	$ 65.00
FX-9	$ 120.00	$ 49.00
CARTN	$ 231.00	$ 59.00
CARTU	$ 105.00	$ 45.00
CARTW	$ 149.00	$ 53.00
E-31	$ 195.00	$ 55.00

Konica Minolta Color Laser Toner

Model	Genuine	TONNY
QMS Magicolor 2300/2350 BK	$121.00	$ 69.00
QMS Magicolor 2300/2350 C/M/Y	$161.00	$ 69.00
QMS Magicolor 2400W/2430DL/2450 BK	$119.00	$ 85.00
QMS Magicolor 2400W/2430DL/2450 C/M/Y	$164.00	$ 85.00

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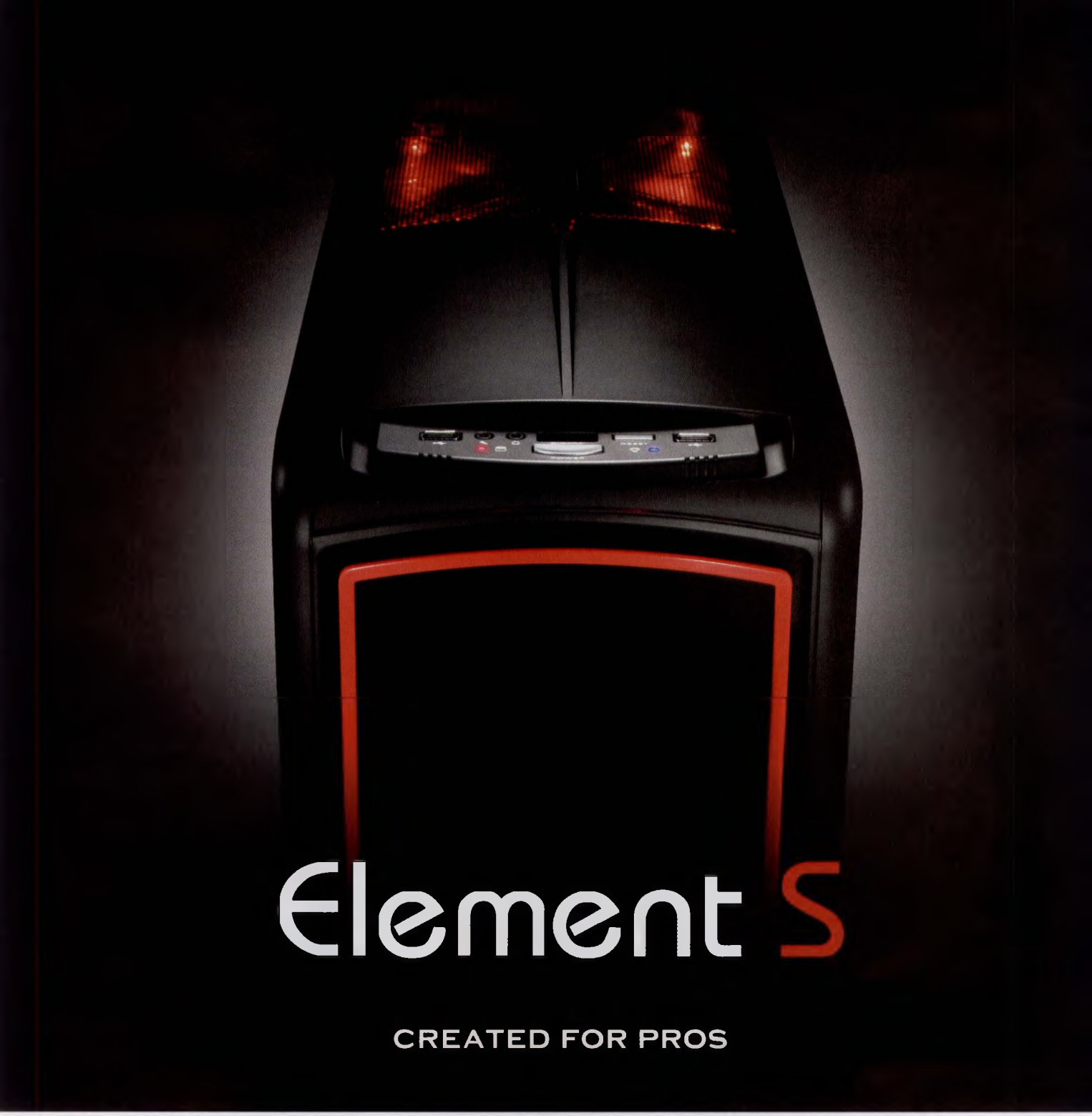

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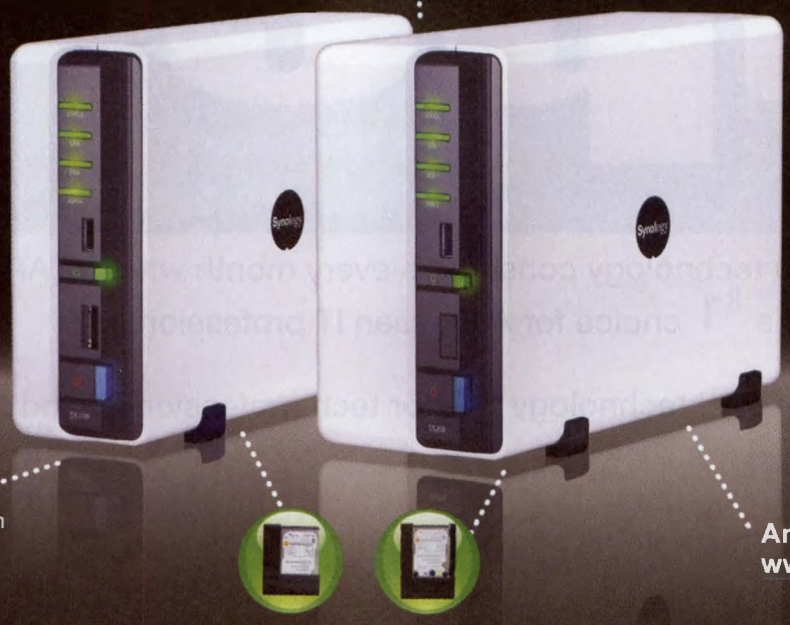

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NUANCE Reseller of the Year 2008
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GPS Navigation

Find your way around Australia the easy way!

TomTom One	TOM0100	$247
TomTom One XL	TOM0101	$336
TomTom GO 730	TOM0106	$549
TomTom GO 930	TOM0103	$719

Digital Photo Frames

Showcase your favourite memories

1.5" Digital Photo Frame Keychain - Black	OZI0001	$17.95
7" Shintaro Digital Photo Frame - Black	SHI0056	$64.95
10.4" Shintaro Digital Photo Frame - Black	SHI0060	$169
15" Shintaro Digital Photo Frame - Black	BUN0057	$229

Nintendo Wii Console & Wii Sports

Fun for all, young and old

Whether they're young or old, expert gamers or beginners, Wii players will express themselves with intuitive motion control using the Wii Remote: a flick of the wrist to swing a baseball bat or tennis racket, a backswing and follow-through to send a golf ball flying over a pristine fairway.

- Vertical Stand
- 1x Wii Remote
- 1x Wii Nunchuck
- 1x Wii Sports Game

WebCode: ALL5085

Nintendo Wii Accessories

Dreamgear Wii Charging Dock (DGE0003) **$35**

Dreamgear Wii Soft Sports Kit (DGE0002) **$27**

Nintendo Wii Fit

Stay fit in the comfort of your home

More than a gaming experience, Wii Fit is a health and lifestyle product with more than 40 exercises

WebCode: ALL5604

Logitech Harmony One Universal Remote

Control up to 15 devices

- Full colour touch screen
- Intuitive button layout and an ergonomic design

WebCode: LOG3681

LaCie LaCinema Classic 1TB

Play your movies, music & photos on any TV

3 easy steps even your grandmother could follow:

Step 1 - Download Movies from your computer to the LaCinema Classic
Step 2 - Connect the LaCinema Classic to your TV
Step 3 - Use the Remote that's included to control the onscreen menus to play your movies

WebCode: LAC9500

Freecom MediaPlayer XS

Stream media from any USB Device!

External multimedia adapter that turns your USB hard drive into a movie machine!

WebCode: FRE0001

Logitech Harmony 785 Universal Remote

Control your Home Entertainment system

- Teletext control
- Easy setup
- Fully backlit keypad

WebCode: LOG3596

Kaiser Baas Video to DVD Maker – Black

Convert your aging VHS video collection straight to DVD

- Burn directly to DVD using PowerProducer
- Composite and S-Video input

WebCode: KAB0017

AVLabs USB HD Digital TV Tuner

Watch TV on your computer!

With the AVLabs USB High Definition Digital TV Tuner, you can enjoy watching or recording digital TV on your computer or laptop.

WebCode: AVL1013

Aiptek Pocket Projector

A truly amazing pocket sized projector

- Projects an image up to 50" from a distance of 1.8m
- New LED light source projects well at only 10 Lumens

WebCode: AIP0001

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Sansai FM Wireless Headphones

Up to 10m Range

The ideal solution for anyone that needs headphones without the inconvenience of wires.

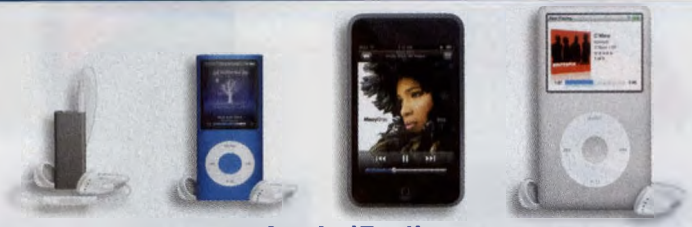
WebCode: SAS0100

AVLabs FM Transmitter with LCD display

Listen to MP3s through FM Radio

- Dock your iPod securely
- LCD Display
- USB interface to charge your iPod

WebCode: AVL1018



Apple iPod's

The audio player of choice - Available in multiple colours

iPod Shuffle - 1GB	APP0500	$64
iPod Nano - 8GB Silver	APP0431	$185
iPod Nano - 16GB Silver	APP0423	$270
iPod Touch - 16GB	APP0442	$399
iPod Touch - 32GB	APP0443	$551
iPod Classic - 120GB Silver	APP0416	$324

Sennheiser HD202 Headphones

High Quality for everyday use

Dynamic Hi-Fi stereo headphones are an ideal partner for DJs. Great for games, and watching movies.

WebCode: SNH0005

Sennheiser CX300 Headphones

Unbelievable treble & bass!

Must have for anyone, who loves listening to music. With Fantastic sound quality, and excellent durability.

WebCode - Silver: SNH0044
WebCode - Black: SNH0040

Edifier IF330+ iPod Dock

Ultra-Portable perfect for notebooks

Dock your iPod into this audio system, and let the good times roll!

- iPhone compatible
- Remote control included

WebCode: EDI0007

Bose Sound Dock

The ideal partner for your iPod

- Charges & plays in high quality audio with amazing acoustic balance
- Remote control included

WebCode - White: BOS0004
WebCode - Black: BOS0003

Sennheiser HD 515 Headphones

Headphones for the audiophile

The HD 515 is an open, dynamic stereo headphone suitable for all kinds of music. It features Sennheiser's innovative E.A.R technology creating a new kind of acoustic experience. If you are seeking an audiophile headphone without having to pay the earth this is the perfect model for you. Come and listen for yourself.

- Ear Coupling
- 14 – 26,000Hz Response
- Max 104dB Output
- 6.25mm Jack

WebCode: SNH0016

Logitech V10 Notebook Speakers

Ultra-Portable perfect for notebooks

- Travel Bag Included
- USB Powered
- Quality Stereo Sound

WebCode: LOG3581

Logitech Z Cinema 2.1 Speakers

Surround Sound Audio System

- Infrared Wireless Remote included
- Great for Gaming, Movies, & Music

WebCode: LOG3680

Logitech Squeezebox Boom

Stream your favourite tunes

The compact all-in-one network music player that lets you listen to the music you love in any room of your home. Simply plug in the power cord and follow the easy setup wizard. You'll be able to instantly browse all the music on your hard drive, tune to thousands of Internet radio stations, and access your favorite online music services.

WebCode: LOG3749

AVLabs Music Studio

Digitize your old vinyls and cassettes to CD or DVD

- Convert Analogue Music to Digital Format
- Capture Music from a Wide Variety of Sources
- Capture and Mix Your Voice with the Music Simultaneously
- Combine your PC and Stereo to Create the Ultimate Home Entertainment

WebCode: AVL1016

Prices are including GST unless otherwise noted. All prices are in AUD $'s. "Save" prices are based on the RRP at time of printing. Only official Australian versions listed. All pictures are for illustration purposes only; actual product may vary from picture. Because of the dynamics of this industry, prices, versions, product details and availability are subject to change without prior notice. Errors & omissions excepted. For out of stock items, delivery dates given are estimates. Rental Finance is available for hardware items over $500. For academic pricing please provide proof of student enrolment, employment from an educational institution or government department as required by the manufacturer for academic, educational or government licensed products. International orders: please call customer service on +61 3 8542 2222. Payment by cheque or direct deposit only. Insurance for delivery of goods is required for all International orders. Warranty & Returns: Goods are not supplied on a trial basis, please check specification & compatibility with the manufacturer prior to purchasing. Our staff can offer advice, but they cannot confirm product compatibility & functionality. All products sold are covered by manufacturers warranties. Please call 1300 658 600 or visit www.citysoftware.com.au for further details and trading terms.*Melbourne only. ABN - 11054615253

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MSI Wind U100+

- Intel Atom N280 1.66GHz
- 1GB DDR2 RAM
- 160GB SATA HDD
- Windows XP Home

WebCode - Black: MSI0010
WebCode - White: MSI0011

Acer Aspire One - Black

- Intel Atom N270 1.6GHz
- 1GB DDR2 RAM
- 160GB SATA HDD
- Windows XP Home

WebCode: ACE1001

HP Mini 1109Tu Netbook

- Intel Atom N270 1.6GHz
- 1GB DDR2 RAM
- 80GB HDD
- Windows XP Home

WebCode: HPR1119

Lenovo S10 Netbook

- Intel Atom N270 1.6GHz
- 1GB DDR2 RAM
- 160GB SATA HDD
- Windows XP Home

WebCode - Black: LNB9505
WebCode - White: LNB9504

MSI VR601 Home Notebook

- Intel Core Duo T2410 2.0GHz
- 2GB DDR2 RAM
- 160GB SATA HDD
- Vista Home Premium

WebCode: MSI8041

Compaq CQ60 Notebook

- Intel Celeron 2.2GHz
- 2GB DDR2 RAM
- 250GB SATA HDD
- Windows Vista Basic

WebCode: COP0107

HP DV2-1001AU Notebook

- AMD Athlon Neo 1.6GHz
- 2GB DDR2 RAM
- 250GB Hard drive
- Windows Vista Basic

WebCode: HPR2100

Lenovo SL500 Notebook

- Intel Core 2 Duo 1.8Ghz
- 1GB DDR2 RAM
- 160GB SATA HDD
- Windows Vista Business

WebCode: LNB9502

MSI EX620 Notebook

- Intel Core 2 Duo 2.4GHz
- 2GB DDR2 RAM
- 320GB SATA HDD
- Vista Home Premium

WebCode: MSI8044

Lenovo R500 Notebook

- Intel Core 2 Duo P8600 2.4GHz
- 2GB DDR2 RAM
- 160GB SATA HDD
- Vista Business
  (Inc XP downgrade)

WebCode: LEN0163

MSI PX600 Notebook

- Intel Core 2 Duo 2.4GHz
- 16" Screen (Leather backing)
- 4GB DDR2 RAM
- 500GB SATA HDD
- Vista Home Premium

WebCode: MSI8039

Asus Eee Box B202 PC

- Intel Atom N270 1.6GHz
- 1GB DDR2
- 80GB HDD SATA
- 10/100/1000 Lan + 802.11n
- Linux

WebCode: ASD0009

Power Adapters

Power up your electronics

Kensington Travel Adapter	KEN0655	$39.95
150W Inverter with USB Outlet	PWR1002	$49.95
Digitek 8 Way Surge Board	BIT0001	$34.95
Ritmo Notebook Charger 90W	RIT0004	$49

Eaton Uninterruptible Power Supplies

Never lose your data again

Eaton 3105 500VA UPS Powerboard	PWR1001	$75
Eaton 3105 700VA UPS Powerboard	PWR1003	$110
Eaton 5110 350VA UPS	PWR1004	$85
Eaton 5110 500VA UPS	PWR1005	$120

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Microsoft LifeCam NX-3000

Ideal for notebooks

- 640 x 480 @ 30 fps
- High Definition 1.3 MP still photos
- Built-in microphone

WebCode: MST8476

Microsoft Wireless Laser Mouse 7000

High definition laser mouse!

- Scrolling 4-way button
- Tilt Wheel technology
- High Definition Laser Technology
- Battery indicator

WebCode: MST8481

Microsoft Wireless Optical Desktop 700 v2

Best value wireless mouse & keyboard

Enjoy freedom from desk clutter with an optical mouse and a compact keyboard design in Microsoft's most affordable wireless desktop.

WebCode: MST8249

Logitech Wave Keyboard

Pure comfort for under $40

- Contoured, wave key design
- Cushioned palm rest
- Adjustable keyboard height

WebCode: LOG3671

Microsoft LifeCam VX-6000

Experience instant messaging in a whole new way

- 1280 x 1024 @ 30 fps
- Automatic face tracking technology
- Built in microphone

WebCode: MST8425

Microsoft Bluetooth Notebook Mouse 5000

Wireless connection to your Bluetooth PC

- More responsive, more precise, and smoother tracking
- Battery light indicator

WebCode: MST8245

Microsoft Wireless Laser Desktop 4000

Leather feel cushion wrist rest

- USB / PS2 wireless receiver
- High Definition Laser Technology
- Ergonomic design

WebCode: MST8460

Microsoft Digital Media Keyboard 3000

Optimised for total Media Control!

- One-touch access to photos, media, & favourites.
- Spill proof
- 3 Year Warranty

WebCode: MST8485

Logitech QuickCam Pro 9000

Crystal clear images and a stylish design

- Up to 8MP images via interpolation
- Automatic face tracking technology
- Skype compatible

WebCode: LOG3650

Verbatim Rapier V1 Gaming Mouse

The ultimate gaming mouse

- 9 Buttons – 7 macro enabled
- 7 Dpi settings (400-3200dpi)
- 7 x Removable 4.5 gram weights
- "Triple Click" hot key

WebCode: VBM9560

Logitech LX310 Cordless Laser Desktop

Power and convenience for your desktop

- Pixel precise photo editing
- One touch controls for music, internet & mail

WebCode: LOG3628

Logitech G15 Gaming Keyboard

Professional gaming keyboard

- Backlit keys for night gaming
- Macro enabled keys
- Media controls at your finger tips
- LCD display

WebCode: LOG3664

Griffin iCurve Elevator Laptop Stand

Essential stands for laptop

Raises the laptop screen to eye level and frees up desktop space for a separate keyboard and mouse. Also it significantly increases airflow around your laptop.

WebCode: GRI0001

Kensington 3 in 1 Keyhub

Calculator, full 19-key pad USB hub all in one

The ultimate productivity tool for number crunchers and the fastest, most convenient way to enter numeric data.

WebCode: KEN3448

Belkin USB Adapters

Quick & easy connectivity

USB To Parallel	BEL2641	$44.95
USB To Serial	BEL0200	$54.95
USB File Transfer	BEL1150	$39.95

Logitech 2.4GHz Cordless Presenter

Move around an auditorium with confidence

Effectively manage your time during presentations with a built-in and programmable LCD timer.

WebCode: LOG3495

Edimax Networking & Cameras Range

Ethernet Digital Pan / Tilt Network Camera 1.3M Pixels
EDI1012 **$118**

Wireless Digital Pan / Tilt Network Camera 1.3M Pixels
EDI1019 **$153**

Wireless G Router with USB Adapter
EDI1021 **$66**

D-Link DSL-G604T Wireless-G ADSL Modem Router

Value packed wireless modem

This router lets you quickly and easily connect to high-speed broadband Internet and share your ADSL line.

WebCode: DLK5109

D-Link Wireless G USB Adapter DWA-110
DLK3003 **$35**

D-Link Wireless G DWA-510 Desktop Adapter
DLK3004 **$35**

D-Link Wireless G DWA-610 Notebook Adapter
DLK3005 **$35**

Billion Networking Range

BIPAC 7300N Wireless N ADSL2+ Modem Router
BIL0035 **$215**

BIPAC 7404VNPX Wireless N VOIP 3G/ADSL2+ Modem Router
BIL0040 **$288**

3010N USB Wireless-N Adapter
BIL0044 **$85**

NETGEAR DGN2000 Modem Router

Get connected the NETGEAR way!

Surf, make Internet phone calls, play online games and stream HD video simultaneously

WebCode: NTG8183

NETGEAR WN111 - RangeMax Next Wireless N USB
NTG8032 **$90**

Netgear RangeMax N PCI Adaptor WN311B
NTG7951 **$138**

NETGEAR RangeMax N PC Card WN511B
NTG7936 **$138**

Linksys AM300 ADSL 2/2+ USB Modem

Low cost ADSL solution!

Blazing fast connection to the Internet, much faster and more convenient than a standard dial-up modem.

WebCode: LNK5549

Linksys WRT610N Dual-N Wireless Router

Faster gaming, music, and HD video streaming

Internet-sharing router and 4-port Gigabit Switch with built-in dual-bands that will increase speed and range.

WebCode: LNK6300

Linksys WPS54G Wireless-G Print Server

Print directly to your network

- Hi-Speed USB
- Wireless-G 802.11G
- 10/100/1000 Port

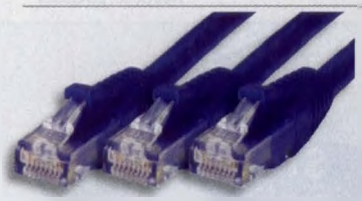
WebCode: LNK0255

NETGEAR ProSafe Gigabit Smart Switch

Management at an Unmanaged Price

- Web-based Management
- Lifetime Warranty
- 48 x 10/100/1000 Ports

WebCode: NTG8144



Cat 5e Patch Cables Blue

Snagless design

0.5m	(COM2010)	**$4**
1m	(COM2011)	**$6**
2m	(COM2012)	**$10**
5m	(COM2013)	**$15**
10m	(COM2014)	**$25**

D-Link Powerline HD Network Starter Kit

Ethernet over existing electrical wires

Create a smooth and secure network with simple plug 'n' play Powerline technology mass storage and stream data into hard to reach areas of the home.

DHP-300 - Powerline HD Ethernet Adapter (DLK0096) **$142**

WebCode: DLK0098

D-Link Omni Directional Indoor Antenna 7dBi

Boost your WiFi range

- Extend Wireless Range up to 1 Km
- 1.5m extension cable attached

5dBi Gain Di-pole Antenna (DLK0210) **$25**

WebCode: DLK9245

Edimax Gigabit Ethernet 2-Bay SATA NAS Server

File sharing via FTP or Network

- Build-in FTP and Samba server
- Supports USB mass storage
- Centralise your network storage
- Delivering faster transfer rates

WebCode: EDI1020

- Serving Australia for 17 years
- Expert staff and hot prices
- Over 15,000 products online

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Canon PIXMA iP100 Portable Inkjet Printer

Affordable document solution

- 20ppm Mono, 14ppm Colour
- 9600 x 2400 dpi
- USB, infrared

WebCode: CAN0732

Black PGI-35	CAN8104	$14
Colour CLI-36	CAN8105	$28

Samsung ML-1640 Mono Laser

Low cost per page!

- 12ppm Mono
- 1200 x 600 DPI
- Parallel, USB
- Duty Cycle Up to 5,000 pages
- Memory 8MB

WebCode: SAM1640

1.5K Black	SAM1641	$90

Samsung ML-2851ND Mono Laser

Mono network printer with duplex

- Up to 28ppm mono
- Duplex printing
- USB, Ethernet
- 2 year onsite warranty

WebCode: SAM2851

5K Black	SAM6359	$200

HP LaserJet P2015dn Mono Laser

Produce quality documents at 1200 dpi

- 26ppm Mono, Duplex
- 1200x1200 dpi
- PCL 5E, PostScript 3, PCL 6
- USB, Ethernet

WebCode: HPL0366

3K Black 53A	HPL7553	$140
5K Black 53X	HPL7554	$258

Canon PIXMA iP4600 Inkjet Printer

Vibrant photos & documents at home

- Up to 21ppm Colour
- 9600x2400 Dpi
- CD & DVD Printing
- USB 2.0

WebCode: CNN0009

Black	CAN7000	$18
Cyan	CAN7003	$18
Magenta	CAN7002	$18
Yellow	CAN7001	$18

Fuji Xerox DocuPrint C1110N Colour Laser

Networked colour laser

- 16ppm Mono & 12ppm Colour
- 9600 x 600 DPI
- USB 2.0, Ethernet
- Duty Cycle 40,000 pages

WebCode: FXP1111

2K Black	FXP1114	$97
2K Cyan	FXP1115	$156
2K Magenta	FXP1116	$156
2K Yellow	FXP1117	$156

Samsung CLP-610ND Colour Laser

Efficient and sharp detail

- 20ppm Colour
- 2400x600 dpi printing
- Built-in Duplexer
- USB, Ethernet

WebCode: SAM0610

5K Black	SAM6361	$168
5K Cyan	SAM6362	$223
5K Magenta	SAM6363	$223
5K Yellow	SAM6364	$223

HP Colour Laserjet CP2025N Printer

Cost effective colour printing

- 20ppm Colour & 20ppm Mono
- 600 x 600 DPI
- USB, Ethernet
- Duty Cycle Up to 5,000 pages
- Memory 128MB

WebCode: HPL4940

3K Black	HPL0350	$200
2.8K Cyan	HPL0351	$188
2.8K Magenta	HPL0353	$188
2.8K Yellow	HPL0352	$188

Canon PIXMA MP980 All-in-One Inkjet Printer

Network-Ready multifunction inkjet

- 9600x2400 dpi printing
- Wireless/Wired LAN
- 3.5" colour TFT screen

WebCode: CNN0980

Black	CAN7000	$18
Grey	CAN7004	$18
Photo Black	CAN7005	$27
Cyan	CAN7003	$18
Magenta	CAN7002	$18
Yellow	CAN7001	$18

Fuji Xerox WorkCentre PE220 Mono Laser Multifunction

Budget multifunction printer

- 20ppm Mono
- 600x600 DPI
- Parallel, USB
- Print, Scan, Copy, Fax

WebCode: FXP1220

6K Black	HPL7553	$189
12K Black	FXP0232	$345

Samsung SCX-4828FN Mono Multifunction

Ideal for all your business needs

- Print, Scan, Copy, Fax
- 28ppm Mono
- Built-in Duplexer
- USB, Ethernet

WebCode: SAM4828

5K Black	SAM6572	$150

Samsung CLX-6210FX Colour Multifunction

Cost effective colour printing

- 20 ppm colour & mono
- Duplex / Copy / Scan / Print / Fax
- USB or Ethernet connection
- 1 Year onsite warranty

WebCode: SAM6210

5K Black	SAM6361	$168
5K Cyan	SAM6362	$223
5K Magenta	SAM6363	$223
5K Yellow	SAM6364	$223

Verbatim 250GB 2.5" Premium Edition Portable Hard Drive

Palm-sized and light weight making it easy to carry with you

Transfer documents & data easily between home and office

WebCode: VBM9551

Seagate FreeAgent Go 320GB Silver

Take all your photos, music & videos everywhere

Automatic backup software helps you easily protect your data.

WebCode: SGA4003

LaCie Network Space - Ethernet Central Storage - 1TB

Store your files on your network

Centralise all of your files and share them among networked PC/Mac computers or UPnP AV certified players. Transfer and back up files from your computers easily, and connect a hard disk or digital camera through the extra USB port for directly storing your data or pictures. No setup is required; just connect the LaCie Network Space to your network and enjoy using it immediately.

WebCode: LAC1000

Verbatim 1TB 3.5" USB 2.0 HDD

Nero back up software included

- Sleek 'Black Steel' Design
- Windows Vista Compatible
- 2 Year Warranty

WebCode: VBM512

Seagate FreeAgent Desk 500GB

Easily protect your data with automatic backup software

Includes easy-to-use software that helps keep your information safe and private with automatic backup and encryption.

WebCode: SGA4104

Netgear RND2000 ReadyNAS Duo 1 x 500 GB

Keep all your Documents, Movies, and Pictures secure

Storage that can be shared with all your computers, media centres, and gaming consoles.

WebCode: NTG8133

NETGEAR ReadyNAS NV+ 4-Bay Gigabit Desktop Network Storage (No HDD)

Designed specifically for home office

WebCode: NTG7998

Verbatim Storage Media

CD-R x 10 Jewel Case	VBM1846	$8
CD-R x 30	VBM4934	$15
CD-R x 50 Inkjet	VBM5005	$17
CD-R x 50	VBM4961	$15
CD-R x 100 Inkjet	VBM5252	$32
CD-R x 100	VBM4554	$27
DVD-R x 25	VBM0580	$12
DVD-R x 50	VBM5101	$21
DVD-R x 50 Inkjet	VBM1973	$23
DVD-R x 100	VBM6049	$37
DVD-R x 100 Inkjet	VBM5153	$42
DVD+R x 25	VBM5033	$12
DVD+R x 50	VBM5037	$21
DVD+R x 50 Inkjet	VBM1974	$23
DVD+R x 100	VBM6050	$37
DVD+R x 100 Inkjet	VBM1995	$42
DVD+R DL 8.5Gb 1Pk	VBM4912	$4
DVD+R DL 8.5Gb 3Pk	VBM5014	$10
DVD+R DL 8.5Gb x 20	VBM4981	$50
BD-R 2x 25GB 5Pk	VBM4361	$68
BD-R 2x 25GB 10Pk	VBM6068	$138

SanDisk Cruzer Micro U3

The market leading flash drive

The Cruzer Micro design is a small, smart and secure USB Flash Drive.

2GB	SAN0061	$15
4GB	SAN0062	$23
8GB	SAN0103	$37
16GB	SAN0164	$66

Kingston DT100 USB Drive

For the budget conscious user

With simplicity in mind, the USB connector is safely housed inside the case, never having to worry about losing a cap.

2GB Black	KNM2629	$12
2GB Blue	KNM2652	$12
2GB Red	KNM2651	$12
4GB Black	KNM2636	$19
8GB Black	KNM2631	$31
16GB Black	KNM2715	$56

Shintaro Hard Drive Docker

Dock your hard drive and Go!

- 2.5/3.5" SATA HDD dock to USB
- Transfer up to 60MB/sec
- Supports - Win 98, ME, 2000, XP, VISTA and MAC OS X, MAC OS 9.

WebCode: SHI0032

SanDisk Cruzer Titanium USB

The Strongest USB Drive Around

Cased in Titanium, and crush-resistant, makes this drive practically indestructible.

4GB	SAN0086	$27
8GB	SAN0127	$47
16GB	SAN0175	$79

Kingston DataTraveler 150 - USB Flash Drive

Big news in mobile storage

Budget conscious users can now break storage barriers, allowing them to easily store and move large files in a device no bigger than a pocketknife.

32GB	KIN0037	$99
64GB	KIN0038	$188

D-Link DUB-H7 7 Port USB 2.0 Hub

Connect up to 7 devices to one USB Port

- Backward compatible to USB 1.1 / 1.0
- Diagnostic LEDs provide port status

WebCode: DLK1122

- Serving Australia for 17 years
- Expert staff and hot prices
- Over 15,000 products online

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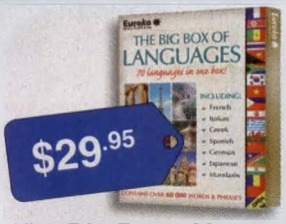
Family Tree Maker 2009 Platinum Edition

Learn more about your family

Everything you'll ever need to trace your ancestors from Australia and beyond is included in Family Tree Maker 2009 – Australian Edition, because it integrates seamlessly with www.ancestry.com.au. Ancestry.com.au is the largest available database of Australian and New Zealand ancestors, and is part of Ancestry.com – the biggest genealogy database in the world. Family Tree Maker is packed full of resources, so spending hours in the library under the microfiche is a thing of the past, it's all here at your fingertips.

$84.95
Save $15

WebCode: AVA1012



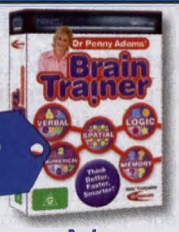
$29.95

The Big Box of Languages

70 Languages in one!

- Comprehensive grammar references with alphabet overview
- Voice Recognition for Pronounciation
- Advanced speech analysis with a listen and speak feature
- Each with 7 fun interactive games

WebCode: NOD0001



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Improve Memory, Increase Concentration and Enhance Logic

- Automatically generates new questions
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WebCode: IMS0048

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Have a Tutor in your home available 24/7

- Improves Maths results by up to 50%
- Covers all State Curriculums, also updateable.
- Full colour Reference book (over 200 pages)
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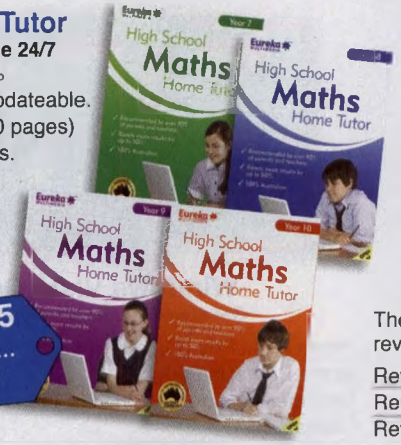
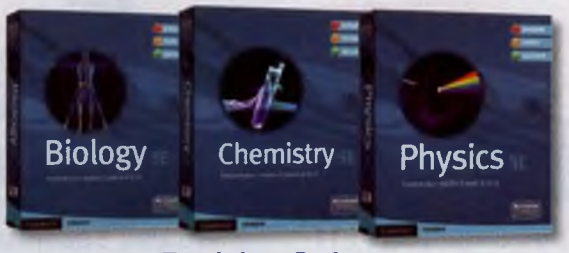
Year 7 - NOD0022
Year 8 - NOD0023
Year 9 - NOD0024
Year 10 - NOD0021



$169.95
Save $20



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Chemistry, Physics & Biology.... Prepare – Revise – Succeed!

These activities are designed to complement classroom work, are ideal for revision before exams and throughout the year, for Years 9 - 12

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Revision Software: Chemistry	REV0002	$58
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WebCode: NOD0004

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Includes:

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Create & print unique family albums.
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Build your family tree. It's easy!
3. Cross Stitch Made Simple
Create your own cross-stitch charts.
4. World Cuisine
Interactive recipe book with over 25,000 recipes
5. 3D Dream Home Designer
Plan, design and create your dream home in 3D
6. Card Maker Deluxe
Create greeting cards for birthdays, weddings, anniversaries and more.

$29.95

WebCode: NOD0025

$69
Save $16

Reallusion CrazyTalk5 Standard

Turn Photos into Talking Videos

CrazyTalk 5 transform photos and images into talking animated characters and bring them to life with real-time puppeteering.

WebCode: REA0006

$230
Save $59

Sony Vegas Movie Studio Platinum Pro 9

HD video editing

- 5.1 surround sound mixing and encoding
- Direct export to Sony PSP
- Advanced primary colour correction tools

WebCode: SON0091

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Save $11

PrintShop 23 Deluxe

#1 desktop publishing software for over 23 years

- The complete and easy way to create impressive print projects
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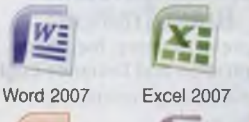
WebCode: MAG0008

Microsoft Office Home & Student 2007

Great for families, excellent for students

The software suite that helps people easily create great-looking documents, worksheets and presentations, as well as manage notes and information at home.



WebCode: MSA6101

Microsoft Office Suites

Create visually stunning documents, worksheets & presentations

Office Outlook Academic 2007	MSA6121	$84	SAVE $14
Small Business Upgrade 2007	MSA6106	$363	SAVE $86
Small Business 2007	MSA6105	$647	SAVE $102
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ACT! by Sage 2009 v11

#1 Selling Contact Manager

Keep all your important relationship details for quick, organised access to the information you need.

WebCode: ACT0039

Business Essentials

Compatible with Word & Excel

- PDF Export from any application
- Learn touch typing
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- 7,000 Fonts and Screensavers

WebCode: NOD0005

Windows Vista Operating Systems

Get started, with the smart & easy operating system

Home Prem Edu Upgrade	MSA5120	$119	SAVE $20
Home Prem Upgrade SP1	MSA5119	$180	SAVE $19
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Dragon NaturallySpeaking

Voice Recognition, Speech-to-text software, perfect for dictation

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Preferred 10 + BONUS PDF Create 5	NUA0091B	$259	SAVE $90
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Nuance PaperPort 11
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Nuance OmniPage Pro 16
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Nuance PDF Converter Pro 5

Create, convert & edit PDF's fast!

The complete PDF solution designed specifically for business users, delivers everything you need to create, convert, and edit PDF files.

WebCode: NUA0064

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Visual Productivity software to better organize, manage & communicate.

SmartDraw gives you the power to quickly create the business graphics you need to succeed, and is the perfect companion product to Microsoft Office.

- Bar graphs and pie charts
- Project timelines
- Mind Maps with integrated Gantt Charts
- Floor plans
- Sales territory maps
- Organisation charts
- Marketing strategy charts
- Forms, and more.

WebCode: SMT0071

Adobe Acrobat 9 Pro

Protect documents with PDF

Communicate and collaborate more effectively and securely with virtually anyone, anywhere.

WebCode - WIN: ALD9649
WebCode - MAC: ALD9651

Adobe Acrobat 9 Pro Extended Windows

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WebCode: ALD9650

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BullGuard Internet Security Gamer Edition	BUL0008	$58
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Norton PC Security

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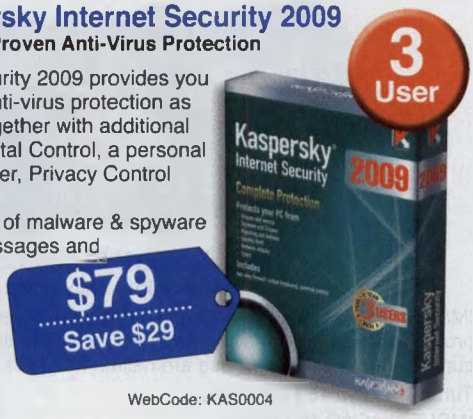
Norton Internet Security 2009 5 User	SYM9957	$127
Norton Internet Security 2009 5 User	SYM9958	$207
Norton 360 3.0 3 User	SYM8800	$109
Norton 360 3.0 5 User	SYM8808	$168
Norton 360 3.0 10 User	SYM8810	$291

Kaspersky Internet Security 2009

Proven Anti-Virus Protection

Kaspersky Internet Security 2009 provides you with the same proven anti-virus protection as Kaspersky Anti-Virus together with additional features including Parental Control, a personal firewall, an anti-spam filter, Privacy Control and more.

- Protects from all types of malware & spyware
- Scans files, email messages and Internet traffic
- Protects instant messengers



WebCode: KAS0004

AVG Internet Security 8.5 with Identity Protection

The Ultimate Security Solution

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- Real-time security while you surf, search and chat online
- Stops junk e-mail and prevents identity theft

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3 User (AVG0041) **$125**
5 Users (AVG0042) **$205**
10 Users (AVG0043) **$420**

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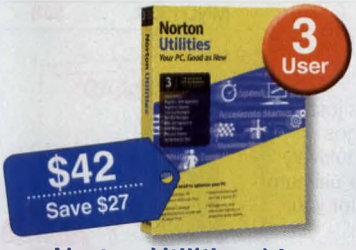

Norton Utilities 14

Optimise your PC, for speed!

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- Accelerates startups
- Defrags disk for faster performance

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Norton Partition Magic 8.0

Creative partitions quickly and easily, without harming your data

Partitioning your hard drive plays an essential role in maintaining your computer, protecting data, improving efficiency, and increasing performance.

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Centrally controlled Anti-Virus protection

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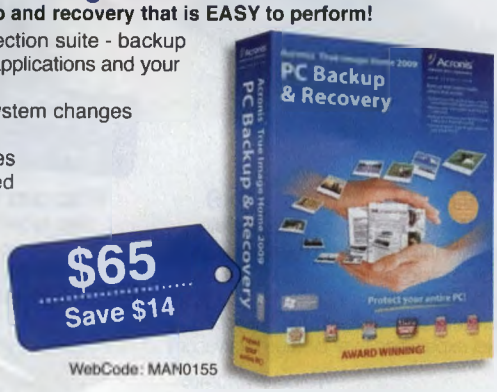
Backup and recovery that is EASY to perform!

A complete data protection suite - backup your entire PC, data, applications and your Operating System.

- Easy Rollback of system changes
- Smart Scheduling
- Protect your archives with password based encryption



WebCode: MAN0155

Norton Ghost 14.0

Backup and restore your entire PC with ease

Backup all of your data including: Applications, Settings, Folders and files.

WebCode: SYM9911

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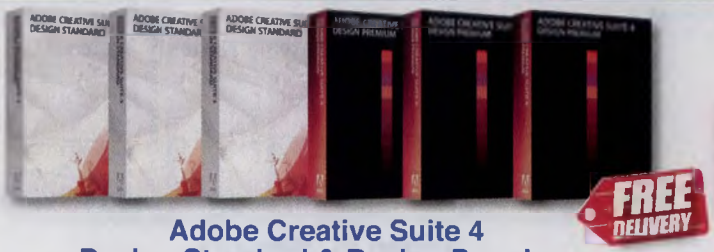

Adobe Creative Suite 4
Design Standard & Design Premium

Design Standard Win - Student	ADS0028	$375	SAVE $24
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Design Standard Win	ALD1209	$2,336	SAVE $489
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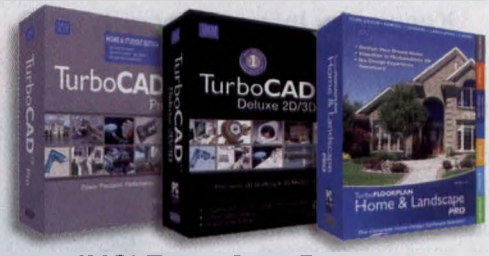
Design Premium Win - Academic	AEP0072	$950	SAVE $184
Design Premium Win	ALD1207	$3,051	SAVE $579

Adobe Creative Suite 4
Web Standard & Web Premium

Web Standard Win - Student	ADS0035	$299	SAVE $50
Web Standard Win - Academic	AEP0087	$599	SAVE $159
Web Standard Win	ALD1217	$1,689	SAVE $330
Web Premium Win - Student	ADS0033	$461	SAVE $138
Web Premium Win - Academic	AEP0085	$876	SAVE $164
Web Premium Win	ALD1215	$2,897	SAVE $532

Adobe Creative Suite 4
Production Premium & Master Collection

Production Premium Win - Student	ADS0031	$499	SAVE $100
Production Premium Win - Academic	AEP0078	$930	SAVE $205
Production Premium Win	ALD1213	$2,897	SAVE $534
Master Collection Win - Student	ADS0024	$869	SAVE $130
Master Collection Win - Academic	AEP0076	$1,587	SAVE $298
Master Collection Win	ALD1211	$4,196	SAVE $844



IMSI TurboCAD Range

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IMSI TurboCAD gives you unlimited design options with hundreds of professional drafting and design tools. Incredible flexibility, low learning curve and overall ease of use are hallmarks of this award-winning program.

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AutoCAD LT software is known for its efficiency, power, and reliability

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Subscription (AUT0225) **$375**

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WebCode: AUT0223

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Upgrade from 2008 (AUT0235) **$1,727**
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Superior page-layout & design

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Wacom Intuos4 6x9

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Discover the tool used by professionals to turn their ideas into reality. With a new design and features inspired by your feedback, Intuos4 represents the finest pen tablet experience ever created by Wacom.

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The tablet that's a screen

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WebCode: WAC9977

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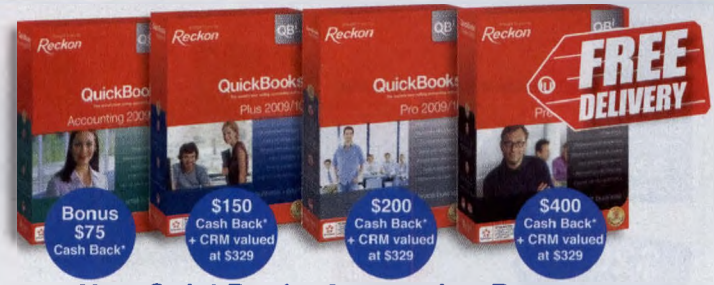
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- Includes: Reciept Printer, Cash Drawer, & Barcode Scanner

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MYOB RetailReady contains all the software and hardware you need to turn your PC into an effective Point of Sale (POS) solution. RetailReady processes sales fast, reports GST and performs "Cash Ups" in just a few clicks.

Includes:

- MYOB Retail Basics
- Barcode Scanner
- Thermal Docket Printer
- Electronic Cash Drawer

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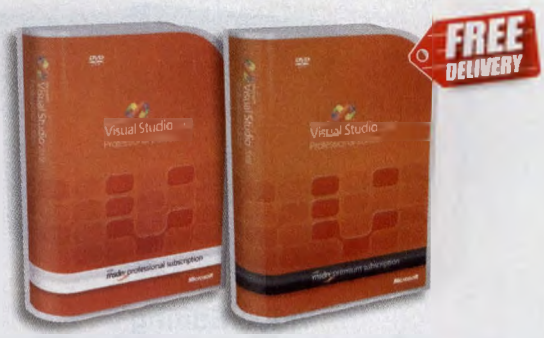
Manage People, Projects, Assets, and More

Whether you need to manage client information, track project details, or produce inventory reports, FileMaker Pro 10 helps you get your important information organized in one place so it's instantly accessible

- **New!** Status Toolbar – Put commonly used features at your fingertips with the redesigned interface. Plus customise the toolbar with features you use the most.
- **New!** Script Triggers - Create and run scripts prompted by user actions for increased productivity

WebCode: FIL2500



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Professional development software

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Automate database change management

Embarcadero Change Manager offers DBAs and developers a powerful set of tools to simplify and automate database change management. Its schema compare and alter, data compare and synchronization, and configuration auditing capabilities report on database changes, roll out new releases, and pinpoint database performance problems.

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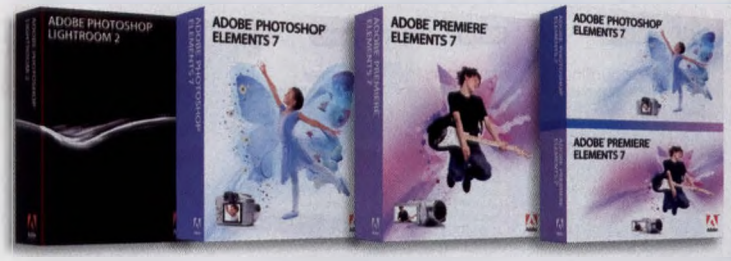
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ADOBE PHOTOSHOP ELEMENTS 7
ADOBE PREMIERE ELEMENTS 7
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Adobe Photoshop Elements 7	ALD0404	$146	SAVE $23
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COR9203 CRL0009

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Roxio Creator 2009

Easily protect what you can't replace

Delivers the industry's best & burning and copying tools for protecting your life stories, digital media and files.

WebCode: ROX5010

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Capture memories with ease

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Belkin Camera Cases

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True plug & play and hot swapping

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WebCode: SIG0008

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4GB (SAN0125) $43
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Extreme III Compact Flash

2GB (SAN0106) $43
4GB (SAN0107) $66
8GB (SAN0108) $111

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AutoCAD LT 2010

Built for Drafting

AutoCAD LT drafting and detailing software is the professional choice because it boosts your productivity.

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- Optimise your work environment with a customisable user interface and efficient organisation and navigation tools.

WebCode: AUT0223

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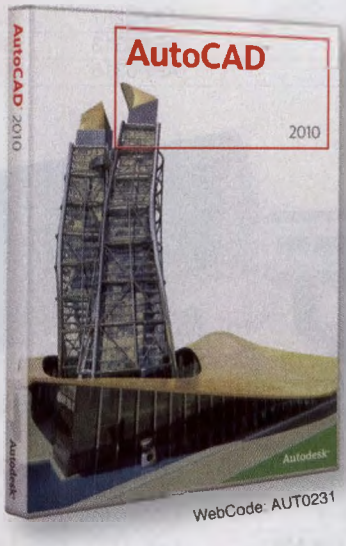

WebCode: AUT0231

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Take Design Further

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- Speed documentation, share ideas seamlessly, explore ideas more intuitively in 3D.

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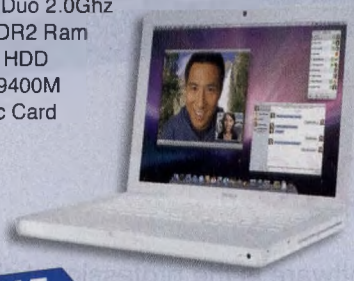

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Apple Final Cut Express 4	APP0364	$253
Apple Protection Plan 3Yr Onsite warranty	APP0646	$268

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3 User

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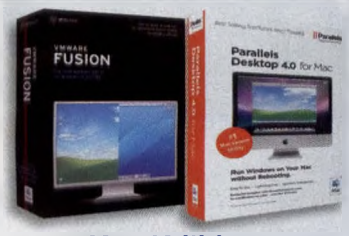

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